

HAWAIIAN
ANNALS

1914-17

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In Memory of
STEPHEN SPAULDING
CLASS OF 1925
UNIVERSITY OF MICHIGAN

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SEP 29 1923

THE HAWAIIAN ANNUAL

THE REFERENCE
BOOK OF HAWAII

Issued Regularly
since 1875

1916



THOS. G. THRDUM
Publisher
Honolulu T.H.

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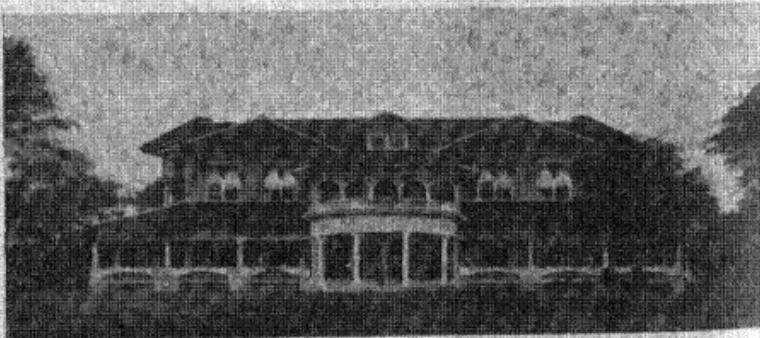


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OAHU RAILWAY & LAND CO.

THIS COMPANY runs regularly to Kahuku, 71 miles from Honolulu. The equipment of the road is first-class in every particular.

EXCURSION RATES are maintained from Saturday till Monday of each week. A delightful ride through varied and unsurpassed scenery makes excursions of the OAHU RAILWAY one of the most attractive features of the Islands, not only to the Tourist, but residents of Honolulu as well. The opportunity to visit a large Sugar Estate should not be missed by those visiting these Islands, and among others on the line of the Railway is the Ewa plantation, one of the largest in the Islands, or by the branch line to Wahiawa, eleven miles from Waipahu, inspect the extensive pineapple industry in that section, or, to Leilehua on the same branch, and visit Schofield Barracks, the principal post of the U. S. Army.



HALEIWA HOTEL
On Line of Oahu Railway

HALEIWA HOTEL.—At Waialua is a beautiful new Hotel, of the most modern construction and equipment, under the management of CLIFFORD KIMBALL, in which guests will find all possible comfort and entertainment, combined with elegance of furnishing, tropical surroundings and healthful atmosphere. The view from the Hotel embraces Sea, Mountain, and Valley in a combination not to be enjoyed elsewhere.

B. F. DILLINGHAM, President

G. P. DENISON,
General Manager.

F. C. SMITH,
Gen'l Passenger & Ticket Agt.

HAWAIIAN
ALMANAC AND ANNUAL
FOR

1916

THE REFERENCE BOOK OF INFORMATION
AND STATISTICS

RELATING TO THE TERRITORY OF HAWAII, OF VALUE TO
MERCHANTS, TOURISTS AND OTHERS

THOS. G. THRUM,
Compiler and Publisher

Forty-Second Year of Publication

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HONOLULU
1915

Counting House
1916 Calendar 1916

SATURDAY	1	8	15	22	29
FRIDAY	.	7	14	21	28
THURSDAY	.	6	13	20	27
WEDNESDAY	.	5	12	19	26
TUESDAY	.	4	11	18	25
MONDAY	.	3	10	17	24
SUNDAY	.	2	9	16	23
JAN.	2	3	10	17	24
	9	10	11	18	25
	16	17	18	25	32
	23	24	25	26	33
	30	31	1	8	15
FEB.	.	1	8	15	22
	6	7	9	16	23
	13	14	15	22	29
	20	21	22	29	36
	27	28	29	30	37
MAR.	.	1	8	15	22
	5	6	7	14	21
	12	13	14	21	28
	19	20	21	28	35
	26	27	28	30	37
APR.	.	1	8	15	22
	2	3	10	17	24
	9	10	11	18	25
	16	17	18	25	32
	23	24	25	26	33
	30	1	8	15	22
MAY	.	2	9	16	23
	7	8	10	17	24
	14	15	16	23	30
	21	22	23	30	37
	28	29	30	31	1
JUNE	.	1	8	15	22
	4	5	12	19	26
	11	12	13	20	27
	18	19	20	21	28
	25	26	27	28	35
JULY	.	1	8	15	22
	8	9	16	23	30
	15	16	17	24	31
	22	23	24	25	1
	29	30	31	1	8
AUG.	.	6	13	20	27
	13	14	15	22	29
	20	21	22	29	36
	27	28	29	30	37
SEPT.	.	3	10	17	24
	10	11	12	19	26
	17	18	19	26	33
	24	25	26	27	34
OCT.	.	1	8	15	22
	8	9	10	17	24
	15	16	17	24	31
	22	23	24	25	1
	29	30	31	1	8
NOV.	.	5	12	19	26
	12	13	14	21	28
	19	20	21	28	35
	26	27	28	29	36
DEC.	.	3	10	17	24
	10	11	12	19	26
	17	18	19	26	33
	24	25	26	27	34
	31	1	8	15	22

Thos. G. Thrum
Researcher and Publisher

**THE HAWAIIAN ANNUAL
HONOLULU, HAWAII**

May - Thomas M. Spaulding
9th
7-23-1923

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HAWAIIAN ANNUAL CALENDAR FOR 1916.

Second half of the eighteenth year and first half of the nineteenth year since annexation of Hawaii with the United States.

Twenty-first year since the downfall of the Monarchy.

The 138th year since the discovery of the Hawaiian Islands by Captain Cook.

Holidays Observed at the Hawaiian Islands.

*New Year	Jan. 1	*Birthday Hawn. Republic.	July 4
Chinese New Year.....	Feb. 3	*American Anniversary ..	July 4
*Washington's Birthday ..	Feb. 22	Labor Day (1st Monday).	Sept. 4
Good Friday	April 21	Regatta Day (3d Saturday) ..	Sept. 16
*Decoration Day	May 30	Thanksgiving Day	Nov. 23
Kamehameha Day	June 11	*Christmas Day	Dec. 25

Those distinguished by the Asterisk have been established by law.

Church Days.

Epiphany	Jan. 6	Whit Sunday	June 11
Ash Wednesday	Feb. 17	Trinity Sunday	June 18
First Sunday in Lent....	March 12	Corpus Christi	June 22
Good Friday	April 21	Advent Sunday	Dec. 3
Easter Sunday	April 23	Christmas	Dec. 25
Ascension Day	June 1		

Eclipses in 1916.

Courtesy of Prof. J. S. Donaghho, College of Hawaii.

In the year 1916 there will be five eclipses, as follows:

- I. A partial eclipse of the moon, January 19, visible in the Hawaiian Islands.
Moon enters shadow 9h. 25m. p.m.
Middle of the eclipse..... 10h. 9.5m. p.m.
Moon leaves shadow 10h. 54m. p.m.
- II. A total eclipse of the sun. February 2, invisible in the Hawaiian Islands.
- III. A partial eclipse of the moon, July 14, the moon rising partially eclipsed. Moon leaves shadow, 8h. 12.5m. p.m.
- IV. An annular eclipse of the sun, July 29, invisible in the Hawaiian Islands.
- V. A partial eclipse of the sun, December 23, invisible in Hawaiian Islands.

FIRST QUARTER, 1916

JANUARY

D H. M.
4 Last Quar. 6.15.4 p.m.
11 First Quar. 5. 7.6 p.m.
19 Full Moon 9.59.0 p.m.
27 Last Quar. 2. 5.1 p.m.

FEBRUARY

D H. M.
3 New Moon 5.35.6 a.m.
10 First Quar. 11.50.4 a.m.
18 Full Moon 3.58.6 p.m.
25 Last Quar. 10.53.8 p.m.

MARCH

D H. M.
3 New Moon 5.27.6 p.m.
11 First Quar. 8. 2.9 a.m.
19 Full Moon 6.56.7 a.m.
26 Last Quar. 5.52.4 a.m.

	Sun Rises . . .	Sun Sets . . .	
Day of Mo. . .	H. M.	H. M.	Day of Wk. . .
1 Sat...	6 37 9	5 29 5	1 Tues..
2 SUN ..	6 38 2	5 30 1	2 Wed..
3 Mon..	6 38 5	5 30 8	3 Thurs
4 Tues..	6 38 7	5 31 4	4 Fri... .
5 Wed..	6 38 9	5 32 1	5 Sat... .
6 Thurs.	6 39 1	5 32 8	6 SUN ..
7 Fri... .	6 39 3	5 33 4	7 Mon..
8 Sat... .	6 39 5	5 34 1	8 Tues..
9 SUN ..	6 39 7	5 34 8	9 Wed..
10 Mon..	6 39 9	5 35 5	10 Thurs
11 Tues..	6 40 1	5 36 2	11 Fri... .
12 Wed..	6 40 2	5 36 9	12 Sat... .
13 Thurs.	6 40 3	5 37 5	13 SUN ..
14 Fri... .	6 40 4	5 38 2	14 Mon..
15 Sat... .	6 40 4	5 38 9	15 Tues..
16 SUN ..	6 40 4	5 39 6	16 Wed..
17 Mon..	6 40 4	40 3	17 Thurs
18 Tues..	6 40 4	40 9	18 Fri... .
19 Wed..	6 40 3	41 6	19 Sat... .
20 Thurs.	6 40 3	42 3	20 SUN ..
21 Fri... .	6 40 2	43 0	21 Mon..
22 Sat... .	6 40 1	43 6	22 Tues..
23 SUN ..	6 39 9	44 3	22 Wed..
24 Mon..	6 39 8	45 0	23 Thurs
25 Tues..	6 39 6	45 6	24 Fri... .
26 Wed..	6 39 4	46 3	25 Sat... .
27 Thurs.	6 39 2	46 9	26 SUN ..
28 Fri... .	6 39 0	47 5	27 Mon..
29 Sat... .	6 38 7	48 1	28 Tues..
30 SUN ..	6 38 4	48 8	29 Wed..
31 Mon..	6 38 0	49 4	30 Thurs

	Sun Rises . . .	Sun Sets . . .	
Day of Mo. . .	H. M.	H. M.	Day of Wk. . .
1 Tues..	6 37 7	5 50 0	1 Wed..
2 Wed..	6 37 4	5 50 6	2 Thurs
3 Thurs	6 37 0	5 51 3	3 Fri... .
4 Fri... .	6 36 6	5 51 9	4 Sat... .
5 Sat... .	6 36 2	5 52 5	5 SUN ..
6 SUN ..	6 35 7	5 53 1	6 Mon..
7 Mon..	6 35 3	5 53 7	7 Tues..
8 Tues..	6 34 8	5 54 2	8 Wed..
9 Wed..	6 33 3	5 54 8	9 Thurs
10 Thurs	6 33 8	5 55 3	10 Fri... .
11 Fri... .	6 33 3	5 55 8	11 Sat... .
12 Sat... .	6 32 8	5 56 3	12 SUN ..
13 SUN ..	6 32 2	5 56 8	13 Mon..
14 Mon..	6 31 6	5 57 3	14 Tues..
15 Tues..	6 31 0	5 57 9	15 Wed..
16 Wed..	6 30 4	5 58 4	16 Thurs
17 Thurs	9 29 8	5 58 9	17 Fri... .
18 Fri... .	6 29 1	5 59 4	18 Sat... .
19 Sat... .	6 28 5	5 59 9	19 SUN ..
20 SUN ..	6 27 8	6 0 4	20 Mon..
21 Mon..	6 27 1	6 0 9	21 Tues..
22 Tues..	6 26 5	6 1 3	22 Wed..
23 Wed..	6 25 8	6 1 7	23 Thurs
24 Thurs	6 25 1	6 2 1	24 Fri... .
25 Fri... .	6 24 4	6 2 5	25 Sat... .
26 Sat... .	6 23 7	6 2 9	26 SUN ..
27 SUN ..	6 23 0	6 3 7	27 Mon..
28 Mon..	6 22 3	6 3 5	28 Tues..
29 Tues..	6 21 6	6 3 8	29 Wed..

	Sun Rises . . .	Sun Sets . . .	
Day of Mo. . .	H. M.	H. M.	Day of Wk. . .
1 Wed..	6 21 1	6 4 2	1 Tues..
2 Thurs	6 20 3	6 4 7	2 Wed..
3 Fri... .	6 19 5	6 5 0	3 Thurs
4 Sat... .	6 18 7	6 5 4	4 Fri... .
5 SUN ..	6 17 9	6 5 8	5 Sat... .
6 Mon..	6 17 0	6 6 2	6 Sun..
7 Tues..	6 16 2	6 6 6	7 Mon..
8 Wed..	6 15 4	6 6 9	8 Tues..
9 Thurs	6 14 5	6 7 3	9 Wed..
10 Fri... .	6 13 7	6 7 7	10 Thurs
11 Sat... .	6 12 8	6 8 0	11 Fri... .
12 SUN ..	6 11 9	6 8 4	12 Sat... .
13 Mon..	6 11 0	6 8 7	13 SUN ..
14 Tues..	6 10 1	6 9 0	14 Mon..
15 Wed..	6 9 2	6 9 3	15 Tues..
16 Thurs	6 8 3	6 9 7	16 Wed..
17 Fri... .	6 7 4	6 10 0	17 Thurs
18 Sat... .	6 6 5	6 10 3	18 Fri... .
19 SUN ..	6 5 6	6 10 6	19 Sat... .
20 Mon..	6 4 7	6 10 9	20 SUN ..
21 Tues..	6 3 8	6 11 2	21 Mon..
22 Wed..	6 2 9	6 11 6	22 Tues..
23 Thurs	6 2 0	6 11 9	23 Wed..
24 Fri... .	6 1 1	6 12 2	24 Thurs
25 Sat... .	6 0 1	6 12 5	25 Fri... .
26 SUN ..	5 59 2	6 12 8	26 Sat... .
27 Mon..	5 58 3	6 13 1	27 SUN ..
28 Tues..	5 57 3	6 13 4	28 Mon..
29 Wed..	5 56 4	6 13 7	29 Tues..
30 Thurs	5 55 5	6 14 0	30 Wed..
31 Fri... .	5 54 6	6 14 4	31 Thurs

VOLCANO OF KILAUEA, ISLAND OF HAWAII.

Corrected for Deflection of the Vertical.

Area, 4.14 square miles, or 2,650 acres.
 Circumference, 41,500 feet, or 7.85 miles.
 Extreme width, 10,300 feet, or 1.95 miles.
 Extreme length, 15,500 feet, or 2.93 miles.
 Elevation, Volcano House, 4,000 feet.

SECOND QUARTER, 1916

APRIL				MAY			
D.	H. M.	D.	H. M.	D.	H. M.	D.	H. M.
2 New Moon	5.51.2 a.m.	1 New Moon	6.58.9 p.m.	8 First Quar.	1.29.0 p.m.	Sun Sets	
10 First Quar.	4. 5.7 a.m.	9 First Quar.	10.17.1 p.m.	15 Full Moon	11.11.7 a.m.		
24 Last Quar.	6.37.5 p.m.	17 Full Moon	3.41.3 a.m.	22 Last Quar.	2.46.3 a.m.		
	0. 8.3 p.m.	23 Last Quar.	6.46.4 p.m.	30 New Moon	0.13.4 a.m.		
		31 New Moon	9. 7.3 a.m.				
Day of Mo. . .	Sun Rises . . .	Day of Wk. . .	Sun Sets . . .	Day of Mo. . .	Sun Rises . . .	Day of Wk. . .	Sun Sets . . .
Day of Mo. . .	H. M.	H. M.		Day of Mo. . .	H. M.	H. M.	
1 Sat...	5 53	7 6	14 7	1 Mon ..	5 29	5 6	24 9
2 SUN	5 52	8 6	15 0	2 Tues ..	5 28	8 6	25 2
3 Mon.	5 51	9 6	15 3	3 Wed ..	5 28	2 6	25 6
4 Tues.	5 51	0 6	15 6	4 Thurs ..	5 27	6 6	26 0
5 Wed.	5 50	1 6	16 0	5 Fri ...	5 27	0 6	26 4
6 Thurs	5 49	2 6	16 3	6 Sat ...	5 26	4 6	26 8
7 Fri...	5 48	3 6	16 6	7 SUN ..	5 25	8 6	27 2
8 Sat...	5 47	4 6	16 9	8 Mon ..	5 25	3 6	27 6
9 SUN	5 46	5 6	17 2	9 Tues ..	5 24	7 6	28 0
10 Mon.	5 45	6 6	17 5	10 Wed ..	5 24	3 6	28 5
11 Tues.	5 44	8 6	17 8	11 Thurs ..	5 23	8 6	28 9
12 Wed.	5 44	0 6	18 1	12 Fri ...	5 23	4 6	29 3
13 Thurs	5 43	2 6	18 4	13 Sat ...	5 22	9 6	29 8
14 Fri...	5 42	3 6	18 8	14 SUN ..	5 22	4 6	30 2
15 Sat...	5 41	5 6	19 1	15 Mon ..	5 22	0 6	30 6
16 SUN	5 40	7 6	19 4	16 Tues ..	5 21	6 6	31 0
17 Mon.	5 39	9 6	19 8	17 Wed ..	5 21	2 6	31 4
18 Tues..	5 39	0 6	20 1	18 Thurs ..	5 20	8 6	31 9
19 Wed..	5 38	2 6	20 5	19 Fri ...	5 20	5 6	32 3
20 Thurs	5 37	4 6	20 8	20 Sat ...	5 20	2 6	32 7
21 Fri...	5 36	6 6	21 2	21 SUN ..	5 19	8 6	33 1
22 Sat...	5 35	8 6	21 5	22 Mon ..	5 19	5 6	33 6
23 SUN	5 35	0 6	21 9	23 Tues ..	5 19	2 6	34 0
24 Mon.	5 34	3 6	22 3	24 Wed ..	5 18	8 6	34 5
25 Tues.	5 33	6 6	22 6	25 Thurs ..	5 18	5 6	34 9
26 Wed..	5 32	9 6	23 0	26 Fri ...	5 18	3 6	35 4
27 Thurs	5 32	2 6	23 3	27 Sat ...	5 18	1 6	35 8
28 Fri...	5 31	4 6	23 7	28 SUN ..	5 17	9 6	36 2
29 Sat...	5 30	8 6	24 1	29 Mon ..	5 17	7 6	36 6
30 SUN..	5 30	1 6	24 5	30 Tues ..	5 17	5 6	37 0
		31 Wed ..	5 17	4 6	37 4		

MOKUAWEOWEO.

The Summit Crater of Mauna Loa, Island of Hawaii.

Area, 3.70 square miles, or 2,370 acres.

Circumference, 50,000 feet, or 9.47 miles.

Length, 19,500 feet, or 3.7 miles.

Width, 9.20 feet, or 1.74 miles. Elevation of summit, 13,675 feet.

THIRD QUARTER, 1916

JULY

D.	H. M.
8 First Quar.	1.25.0 a.m.
14 Full Moon	6.10 0 p.m.
21 Last Quar.	1. 3.0 p.m.
29 New Moon	3.45.4 p.m.

AUGUST

D.	H. M.
6 First Quar.	10.35.6 a.m.
13 Full Moon	1.30.3 a.m.
20 Last Quar.	2 22.8 a.m.
28 New Moon	6.54.7 a. m.

SEPTEMBER

D.	H. M.
4 First Quar.	5 56 5 p.m.
11 Full Moon	10. 0 9 a.m.
18 Last Quar.	7. 5.3 p.m.
26 New Moon	9. 4.1 p.m.

Day of Mo...	Sun Rises . . .	Sun Sets . . .
Day of Wk...	Sun Rises . . .	Sun Sets . . .
Day of Mo...	Sun Rises . . .	Sun Sets . . .
1 Sat...	5 21 16 45 8	
2 SUN.	5 21 46 45 8	
3 Mon..	5 21 76 45 9	
4 Tues..	5 22 16 45 8	
5 Wed..	5 22 46 46 8	
6 Thurs	5 22 86 45 8	
7 Fri...	5 23 16 45 8	
8 Sat...	5 23 56 45 8	
9 SUN.	5 23 86 45 7	
10 Mon..	5 24 26 45 6	
11 Tues.	5 24 56 45 5	
12 Wed..	5 24 96 45 4	
13 Thurs	5 25 46 45 3	
14 Fri...	5 25 86 45 1	
15 Sat...	5 26 26 44 9	
16 SUN.	5 26 66 44 7	
17 Mon..	5 27 06 44 5	
18 Tues.	5 27 46 44 3	
19 Wed..	5 27 86 44 1	
20 Thurs	5 28 26 43 8	
21 Fri...	5 28 66 43 5	
22 Sat...	5 29 06 43 2	
23 SUN.	5 29 46 42 8	
24 Mon..	5 29 86 42 5	
25 Tues.	5 30 26 42 1	
26 Wed..	5 30 66 41 7	
27 Thurs	5 31 06 41 3	
28 Fri...	5 31 46 40 9	
29 Sat...	5 31 86 40 5	
30 SUN.	5 32 26 40 0	
31 Mon..	5 32 56 39 5	

Day of Mo...	H. M.	H. M.
Day of Wk...	H. M.	H. M.
Day of Mo...	H. M.	H. M.
1 Tues.	5 32 96 39 0	
2 Wed..	5 33 06 38 5	
3 Thurs	5 33 76 38 0	
4 Fri...	5 34 16 37 4	
5 Sat...	5 34 46 36 9	
6 SUN.	5 34 86 36 3	
7 Mon..	5 35 26 35 7	
8 Tues.	5 35 76 35 1	
9 Wed..	5 35 96 34 5	
10 Thurs	5 36 36 33 8	
11 Fri...	5 36 66 33 2	
12 Sat...	5 37 06 32 5	
13 SUN.	5 37 36 31 8	
14 Mon..	5 37 76 31 1	
15 Tues.	5 38 06 30 4	
16 Wed..	5 38 36 29 7	
17 Thurs	5 38 76 29 0	
18 Fri...	5 39 06 28 2	
19 Sat...	5 39 36 27 5	
20 SUN.	5 39 66 26 7	
21 Mon..	5 39 96 25 9	
22 Tues.	5 40 36 25 1	
23 Wed..	5 40 66 24 3	
24 Thurs	5 40 96 23 5	
25 Fri...	5 41 26 22 6	
26 Sat...	5 41 46 21 0	
27 SUN.	5 41 76 20 9	
28 Mon..	5 42 06 20 1	
29 Tues.	5 42 36 19 2	
30 Thurs	5 42 66 18 3	
31 Fri...	5 42 96 17 4	

Day of Mo...	H. M.	H. M.
Day of Wk...	Sun Rises . . .	Sun Sets . . .
Day of Mo...	Sun Rises . . .	Sun Sets . . .
1 Fri...	5 43 26 16 6	
2 Sat...	5 43 46 15 7	
3 SUN.	5 43 76 14 8	
4 Mon..	5 43 96 13 9	
5 Tues.	5 44 26 13 0	
6 Wed..	5 44 56 12 0	
7 Thurs	5 44 76 11 1	
8 Fri...	5 45 06 10 2	
9 Sat...	5 45 36 9 2	
10 SUN.	5 45 56 8 3	
11 Mon..	5 45 86 7 3	
12 Tues.	5 46 06 6 4	
13 Wed..	5 46 36 5 4	
14 Thurs	5 46 56 4 4	
15 Fri...	5 46 86 3 5	
16 Sat...	5 47 06 2 5	
17 SUN.	5 47 36 1 6	
18 Mon..	5 47 56 0 6	
19 Tues.	5 47 85 59 7	
20 Wed..	5 48 05 58 7	
21 Thurs	5 48 35 57 8	
22 Fri...	5 48 55 56 8	
23 Sat...	5 48 85 55 9	
24 SUN.	5 49 05 54 9	
25 Mon..	5 49 35 53 9	
26 Tues.	5 49 65 53 0	
27 Wed..	5 49 85 52 1	
28 Thurs	5 50 15 51 1	
29 Fri...	5 50 45 50 2	
30 Sat...	5 50 75 49 2	

IAO VALLEY, ISLAND OF MAUI.

Length (from Wailuku), about 5 miles.

Width of Valley, 2 miles.

Depth, near head, 4,000 feet.

Elevation of Puu Kukui, above head of Valley, 5,700 feet.

Elevation of Crater of Eke, above Waihee Valley, 4,500 feet.

FOURTH QUARTER, 1916.

OCTOBER			NOVEMBER			DECEMBER		
D.	H. M.		D.	H. M.		D.	H. M.	
4 First Quar.	0.30.5 a.m.		2 First Quar.	7.20.6 a.m.		1 First Quar.	3.25.5 p.m.	
10 Full Moon	8.31.1 p.m.		9 Full Moon	9.48.0 a.m.		9 Full Moon	2.18.9 a.m.	
18 Last Quar.	2.38.7 p.m.		17 Last Quar.	11.30.5 a.m.		17 Last Quar.	7.36.4 a.m.	
26 New Moon	10. 7.0 a.m.		24 New Moon	10.20.4 p.m.		24 New Moon	10. 1.2 a.m.	
Day of Mo... Day of Wk...	Sun Rises... Sun Sets...		Day of Mo... Day of Wk...	Sun Rises... Sun Sets...		Day of Mo... Day of Wk...	Sun Rises... Sun Sets...	
	H. M.	H. M.		H. M.	H. M.		H. M.	H. M.
1 SUN.	5 51 0	5 48 3	1 Wed..	6 2 8	5 24 4	1 Fri....	6 20 9	5 17 2
2 Mon..	5 51 3	5 47 4	2 Thurs	6 3 3	5 23 9	2 Sat...	6 21 5	5 17 3
3 Tues.	5 51 6	5 46 5	3 Fri....	6 3 8	5 23 3	3 SUN.	6 22 2	5 17 4
4 Wed..	5 51 8	5 45 6	4 Sat....	6 4 3	5 22 8	4 Mon..	6 22 8	5 17 5
5 Thurs	5 52 1	5 44 7	5 SUN.	6 4 9	5 22 4	5 Tues.	6 23 5	5 17 7
6 Fri....	5 52 4	5 43 8	6 Mon..	6 5 4	5 21 9	6 Wed..	6 24 5	5 17 9
7 Sat...	5 52 7	5 42 9	7 Tues.	6 6 0	5 21 4	7 Thurs	6 24 8	5 18 1
8 SUN.	5 53 1	5 42 0	8 Wed..	6 6 5	5 21 0	8 Fri....	6 25 4	5 18 4
9 Mon..	5 53 4	5 41 1	9 Thurs	6 7 1	5 20 7	9 Sat....	6 26 0	5 18 7
10 Tues.	5 53 8	5 40 2	10 Fri....	6 7 6	5 20 2	10 SUN.	6 26 6	5 19 0
11 Wed..	5 54 1	5 39 4	11 Sat...	6 8 2	5 19 9	11 Mon..	6 27 3	5 19 3
12 Thurs	5 54 5	5 38 6	12 SUN.	6 8 9	5 19 5	12 Tues.	6 27 9	5 19 6
13 Fri....	5 54 8	5 37 7	13 Mon..	6 9 5	5 19 2	13 Wed..	6 28 5	5 19 9
14 Sat...	5 55 1	5 36 9	14 Tues.	6 10 1	5 18 9	14 Thurs	6 29 1	5 20 3
15 SUN.	5 55 5	5 36 1	15 Wed..	6 10 7	5 18 6	15 Fri ...	6 29 7	5 20 6
16 Mon..	5 55 8	5 35 3	16 Thurs	6 11 3	5 18 3	16 Sat...	6 30 3	5 21 0
17 Tues.	5 56 2	5 34 5	17 Fri....	6 11 9	5 18 0	17 SUN.	6 30 8	5 21 5
18 Wed..	5 56 6	5 33 7	18 Sat...	6 12 5	5 17 8	18 Mon..	6 31 4	5 21 9
19 Thurs	5 56 9	5 32 9	19 SUN.	6 13 1	5 17 6	19 Tues.	6 31 9	5 22 3
20 Fri....	5 57 3	5 32 2	20 Mon..	6 13 7	5 17 4	20 Wed..	6 32 5	5 22 8
21 Sat...	5 57 7	5 31 4	21 Tues.	6 14 3	5 17 2	21 Thurs	6 33 0	5 23 3
22 SUN	5 58 2	5 30 7	22 Wed..	6 15 0	5 17 1	22 Fri....	6 33 5	5 23 8
23 Mon..	5 58 6	5 30 0	23 Thurs	6 15 7	5 17 1	23 Sat...	6 34 0	5 24 3
24 Tues.	5 59 1	5 29 3	24 Fri....	6 16 3	5 17 0	24 SUN.	6 34 5	5 24 8
25 Wed..	5 59 5	5 28 7	25 Sat...	6 17 0	5 17 0	25 Mon..	6 35 0	5 25 3
26 Thurs	6 0 0	5 28 0	26 SUN.	6 17 6	5 17 0	26 Tues.	6 35 5	5 25 9
27 Fri....	6 0 4	5 27 4	27 Mon..	6 18 2	5 17 0	27 Wed..	6 35 9	5 26 5
28 Sat...	6 0 9	5 26 7	28 Tues.	6 18 9	5 17 0	28 Thurs	6 36 3	5 27 0
29 SUN.	6 1 4	5 26 1	29 Wed..	6 19 6	5 17 1	29 Fri....	6 36 6	5 27 6
30 Mon..	6 1 8	5 25 5	30 Thurs	6 20 2	5 17 1	30 Sat...	6 37 0	5 28 2
31 Tues.	6 2 3	5 24 9				31 SUN.	6 37 3	5 28 8

HALEAKALA, ISLAND OF MAUI.

The great Crater of Maui, the largest in the world.

Area, 19 square miles, or 12,160 acres.

Circumference, 105,600 feet, or 20 miles.

Extreme width, 2.37 miles.

Extreme length, 39,500 feet, or 7.48 miles.

Elevation to summit, 10,032 feet.

Elevation of principal cones in crater, 8,032 and 1,572 feet.

Elevation of cave in floor of crater, 7,380 feet.

INTER-ISLAND DISTANCES BY SEA IN SEA MILES.

AROUND OAHU FROM HONOLULU—ESPLANADE WHARF TO

	Miles.		Miles.
Bell Buoy	1 1/4	Pearl River Bar.....	6
Diamond Head	5	Barber's Point	15
Koko Head	12	Waianae Anchorage	26
Makapuu Point	16	Kaena Point, N. W. of Oahu.....	36
Mokapu	27	Waialua Anchorage	46
Kahuku North Point.....	48	Kahuku N. Pt., Oahu, via Kaena.	58

HONOLULU TO

Lae o ka Laau, S. W. Pt. Molokai	35	Mahukona, Hawaii.....	134
Kalaupapa, Leper Settlement..	52	Kawaihae, "	144
West Point of Lanai.....	50	Kealakekua, " (direct)	157
Lahaina, Maui.....	72	S. W. Pt. "	233
Kahului, "	90	Punaluu,	250
Hana, "	128	Hilo,	192
Maalaea, "	86	" "	(windward) .206
Makena, "	96	" "	(via Kawai- hae.....230

HONOLULU TO

Nawiliwili, Kauai.....	98	Hanalei, Kauai	125
Koloa, "	102	Niihau	144
Waimea, "	120		

LAHAINA, MAUI, TO

Kaluaaha, Molokai	17	Maalaea, Maui	12
Lanai	9	Makena, Maui	18

KAWAIHAE, HAWAII, TO

Mahukona, Hawaii	10	Hilo, Hawaii	85
Waipio, Hawaii	37	Lae o ka Mano, Hawaii.....	20
Honokaa, Hawaii	45	Kailua, Hawaii	34
Laupahoehoe, Hawaii	62	Kealakekua, Hawaii	44

HILO, HAWAII, TO

East Point of Hawaii.....	20	Punaluu, Hawaii	70
Keauhou, Kau, Hawaii.....	50	Kaalualu, Hawaii	80
North Point of Hawaii.....	62	South Point of Hawaii.....	85

WIDTH OF CHANNELS.

Oahu and Molokai.....	23	Maui and Lanai.....	7
Diamond Head to S. W. Point of Molokai	30	Maui and Kahoolawe.....	6
Molokai and Lanai.....	7	Hawaii and Maui.....	26
Molokai and Maui.....	8	Kauai and Oahu.....	63
		Niihau and Kauai.....	15

OCEAN DISTANCES.

HONOLULU TO

San Francisco	2100	Auckland	3810
San Diego	2260	Sydney	4410
Portland, Or.	2360	Hongkong	4920
Brito, Nicaragua	4200	Yokohama	3400
Panama	4720	Guam	3300
Tahiti	2440	Manila, via N. E. Cape.....	4890
Samoa	2290	Victoria, B. C.....	2460
Fiji	2700	Midway Islands	1200

OVERLAND DISTANCES.

ISLAND OF OAHU.

HONOLULU POST-OFFICE TO

	Miles.		Miles.	Inter.
Bishop's corner (Waikiki)	3.2	Punaluu	28.4	2.0
Waikiki Villa	3.6	Hauula	31.4	3.0
Diamond Head	5.9	Lai'e	34.4	3.0
Kaalawai	6.0	Kahuku Mill	37.2	2.8
		Kahuku Ranch	40.0	2.8
Thomas Square	1.0	Moanalua	3.4	
Pawaa corners	2.0	Kalauao	7.4	4.0
Kamoiliili	3.3	Ewa Church	10.2	2.8
Kaimuki Hill Reservoir	5.0	Kipapa	13.6	3.4
Waialae	6.2	Kaukonahua	20.0	6.4
Niu	8.8	Leilehua	20.0	
Koko Head	11.8	Waialua	28.0	8.0
Makapuu	14.8	Waimea	32.4	4.4
Waimanalo	20.8	Kahuku Ranch	39.4	7.0
Waimanalo, via Pali	12.0			
Nuuanu Bridge	1.1			
Mausoleum	1.5			
Electric Reservoir	2.7			
Luakaha	4.3			
Nuuanu Dam	5.0			
Pali	6.6			
Kaneohe	11.9			
Waiahole	18.9			
Kualoa	21.9			
Kahana	26.4			
	4.5			

ISLAND OF HAWAII.

SOUTH KOHALA.—WAIMEA COURT HOUSE, TO

	Miles.	Inter.		Miles.	Inter.
Hamakua boundary	4.5	..	Hilo, via Humuula Stn.	54.0	25.0
Kukuihaele Mill	11.0	6.5	Keamuku Sheep Stn.	14.0	..
Mana	7.7	..	Napuu	22.0	8.0
Hanaipoe	15.0	7.3	Keawewai	8.0	..
Keanakolu	24.0	9.0	Waika	11.0	3.0
Puakala	34.0	10.0	Kahuwa	13.0	2.0
Laumaia	36.5	2.5	Puuhue	17.0	4.0
Auwaiakekua	12.5	..	Kohala Court House	22.0	5.0
Humuula Sheep Sation	29.0	16.5	Mahukona	22.0	..
via Laumaia	47.5	..	Puako	12.0	..

NORTH KOHALA.—FOREIGN CHURCH, KOHALA, TO

	Miles.		Miles.
Edge of Pololu Gulch	4.00	Union Mill	2.25
Niulii Mill	2.80	Union Mill R. R. Station	3.25
Halawa Mill	1.65	Honomakau	2.55
Hapuu Landing	2.15	Hind's, Hawi	3.25
Kohala Mill . . . . .	.50	Hawi R. R. Station	4.25
Kohala Mill Landing	1.50	Honoipo	7.25
Native Church	1.00	Mahukona	10.50
		Puuhue Ranch	7.25

NORTH KOHALA.—ON MAIN ROAD, MAHUKONA TO
Miles. Inter.

	Miles.	Inter.	Miles.	Inter.
Hind's Mill	7.0	..	Wight's Corner	11.5
Union Mill Corner.....	8.0	1.0	Niulii Corner	12.8
Court House	9.2	1.2	Pololu Edge of Gulch.....	14.5
Bond's Corner	9.7	0.5	Puu Hue	5.0
Kohala Mill Corner.....	10.4	0.7		..

SOUTH KOHALA.—KAWAIHAE TO

	Miles.	Inter.	Miles.	
Puu Ainako	4.4	..	Mana, Parker's	19.5
Puuiki	7.7	3.3	Keawewai	6.0
Waiaka, Catholic Ch... .	9.5	1.8	Puuhue Ranch	10.0
Puuopelu, Parker's	10.8	1.3	Kohala Court House	15.0
Waimea Court House.....	11.8	1.0	Mahukona	11.0
Waimea Church	12.2	0.4	Napuu	20.0
Kukuihaele Church	22.1	9.9	Puako	5.0

KONA.—KEALAKEKUA TO

Keauhou	6.0	..	Kawaihae	42.0	4.6
Holualoa	9.6	3.6	Honaunau	4.0	..
Kailua	12.0	2.4	Hookena	7.7	3.7
Kaloko	16.0	4.0	Olelomoana	15.2	7.5
Makalawena	19.6	3.6	Hoopuloa	21.6	6.4
Kiholo	27.6	8.0	Boundary of Kau.....	24.8	3.2
Ke Au a Lono bound'y.	31.6	4.0	Flow of '87.....	32.0	7.2
Puako	37.4	5.8	Kahuku Ranch	36.5	4.5

KAU.—VOLCANO HOUSE TO

Half-way House	13.0	..	Honuapo	32.6	5.0
Kapapala	18.0	5.0	Naalehu	35.6	3.0
Pahala	23.0	5.0	Waiohinu	37.1	1.5
Punaluu	27.6	4.6	Kahuku Ranch	43.1	6.0

PUNA.—HILO COURT HOUSE TO

	Miles.		Miles.	
Keauau, Forks of Road.....	9.0		Kaimu	32.0
Pahoia	20.0		Kalapana	33.0
Pohoiki	28.0		Keauhou	50.0
Kapoho (Lyman's)	32.0		Panau	40.0
Opihikao	31.0		Volcano House via Panau.....	56.0
Kamaili	26.0		Sand Hills, Naawale, old road.	18.5
Kamaili Beach	29.0		Kapoho, old road	22.0

TO VOLCANO.—HILO TO

Shipman's	1.7		Mountain View	16.8
Edge of Woods	4.1		Mason's	17.5
Coconut Grove	8.0		Hitchcock's	23.5
Branch Road to Puna.....	9.0		Cattle Pen	24.7
Furneaux's	13.2		Volcano House	31.0

THROUGH HILO DISTRICT TO

Honolii Bridge	2.5		Honohina Church	17.8
Papaikou Office	4.7		Waikaumalo Bridge	18.8
Onomea Church	6.9		Pohakupuka Bridge	21.0
Kaupakuea Cross Road	10.7		Maulua Gulch	22.0
Kolekole Bridge	14.3		Kaiwilahilahi Bridge	24.0
Hakalau, east edge gulch.....	15.0		Lydgate's House	26.1
Umauma Bridge	16.0		Laupahoehoe Church	26.7

THROUGH HAMAKUA.—LAUPAHOEHOE CHURCH TO

	Miles.	Miles.	
Bottom Kawai Gulch.....	2.0	Kuaikalua Gulch	22.0
Ookala, Manager's House.....	4.0	Kapulena Church	23.9
Kealakaha Gulch	6.0	Waipanihua	24.3
Kukaiau Gulch	8.0	Stream at Kukuihaele	26.0
Horner's	8.5	Edge Waipio	26.5
Catholic Church, Kainehe.....	9.0	Bottom Waipio	27.0
Notley's, Paauilo	10.5	Waimanu (approximate)	32.5
Kaumoalii Bridge	12.5	Kukuihaele to Waimea (approximate)	10.5
Bottom Kalopa Gulch.....	14.0	Gov't. Road to Hamakua Mill..	1.5
Wm. Horner's, Paauhau.....	15.2	Gov't. Road to Paauhau Mill...	1.0
Paauhau Church	16.3	Gov't. Road to Pacific Sugar	
Holmes' Store, Honokaa.....	18.0	Mill, Kukuihaele	0.7
Honokaia Church	20.5		

ISLAND OF MAUI.

KAHULUI TO

	Miles.	Inter.	Miles.	Inter.
Spreckelsville	4.0	..	Paia P. O.....	7.2 ..
Paia P. O.....	7.2	3.2	Makawao Court House.	11.6 4.4
Hamakuapoko Mill	9.2	2.0	Olinda	18.5 6.9
Haiku P. O.....	11.0	1.8	Haleakala, edge Crater.	26.6 8.1
Halehaku	17.2	6.2	Haleakala Summit	28.6 2.0
Huelo School	20.2	3.0		
Keanae P. O.....	35.5	15.3	Maalaea	10.3 ..
Nahiku Landing	49.9	14.4	End of Mountain Road.	15.8 5.5
Ulaino School	49.2	.7	Olowalu	19.9 4.1
Hana P. O.....	55.6	6.4	Lahaina Court House.	25.5 5.6
Hamoa	58.2	2.6		
Wailua	62.6	4.4	Waiheu	6.4 ..
Kipahulu Mill	66.2	3.6	Waihee	7.3 0.9
Mokulau	71.8	5.6	Kahakuloa	16.3 9.0
Nuu	77.0	5.2	Honokohau	23.0 6.7
			Honolua	27.0 4.0
Wailuku	3.8	..	Napili	29.8 2.8
Waikapu	5.9	2.1	Honokawai	33.5 3.7
Maalaea	10.3	4.4	Lahaina Court House.	39.0 5.5
Kihei	12.6	2.3		
Kalepolepo	13.9	1.3	MAKENA TO	
Ulupalakua	23.6	9.7	Ulupalakua	3.5 ..
Kanaio	26.8	3.2	Kamaole	7.3 3.8
Pico's	33.8	7.0	Waiakoa	13.0 5.7
Nuu	40.6	6.8	Makawao P. O.....	20.8 7.8
			Makawao Court House.	23.0 2.2

ISLAND OF KAUAI.

NAWILIWILI TO

	Miles.	Inter.	Miles.	Inter.
Koloa	11.0	..	Wailua River	7.7 4.4
Lawai	13.8	2.8	Kealia	11.9 4.2
Hanapepe	20.0	6.2	Anahola	15.7 3.8
Waimea	27.1	7.1	Kilauea	23.6 7.9
Waiawa	31.5	4.4	Kalihiwai	26.6 3.0
Nuololo	44.8	13.3	Hanalei	31.8 5.2
Hanamaulu	3.3	..	Wainiha	34.8 3.0
			Nuololo (no road)	47.0 12.2

ISLAND OF MOLOKAI.

KAUNAKAKAI TO

	Miles.		Miles.
Meyer's, Kalae	5.0	Pukoo	15.0
Kalaupapa	9.0	Halawa	25.0
Kamalo	9.0	Ka Lae o ka Laau.....	19.0
Kaluaaha	13.5		

OAHU RAILWAY DISTANCES.—FROM HONOLULU DEPOT TO

	Miles.		Miles.
Puuloa	6.0	Gilbert	23.0
Aiea	9.0	Nanakuli	27.0
Kalauao	10.0	Waianae	33.0
Waiau	11.0	Makaha	35.0
Pearl City	12.0	Makua	41.0
Waipio	14.0	Kawaihapai	50.0
Waipahu	14.0	Mokuleia	53.0
Leilehua	27.0	Puiki	55.0
Wahiawa	25.0	Waialua	56.0
Hoaeae	15.0	Haleiwa Hotel	56.0
Honouliuli	16.0	Waimea	62.0
Ewa Mill	18.0	Kahuku	71.0

Revised Areas and Coast Line Distances, Hawaiian Islands.

Prepared by R. D. King, Survey Department.

Courtesy Walter E. Wall, Surveyor, Terr. Hawaii.

Islands	Miles Square	Acres Area	Coast in Miles Line	Altitude in Feet
Hawaii	4,015.6	2,570,000	297	13,825
Oahu	598.0	382,720	177	4,030
Maui	728.1	466,000	146	10,032
Kauai	546.9	350,000	106	5,170
Molokai	260.9	167,000	100	4,958
Lanai	139.5	89,305	53	3,400
Niihau	72.8	46,575	48	1,300
Kahoolawe	44.2	28,260	30	1,427
	6,406.0	4,099,860	957	

Seating Capacity of Principal Churches, Halls and Places of Amusement—Honolulu.

Roman Catholic Cathedral, Fort street.....	1,500
Hawaiian Opera House, King street.....	1,000
Kawaihao Church (Native), King street.....	1,000
Central Union Church, Beretania street.....	850
St. Andrew's Cathedral (Episcopal), Emma street.....	800
The Bijou (vaudeville).....	1,600
Ye Liberty Theater.....	1,600
Empire Theater (moving pictures).....	930
Y. M. C. A. game hall.....	850

**Total Population by Districts and Islands — Comparative,
1900 and 1910.**

HAWAII	1900	1910	OAHU	1900	1910
Hilo	19,785	22,545	Honolulu	39,306	52,183
Puna	5,128	6,834	Ewa	9,689	14,627
Kau	3,854	4,078	Waianae	1,008	1,958
North Kona.....	3,819	3,377	Waialua	3,285	6,770
South Kona.....	2,372	3,191	Koolauloa	2,372	3,204
North Kohala....	4,366	5,398	Koolaupoko	2,844	3,251
South Kohala....	600	922			
Hamakua	6,919	9,037		58,504	81,993
	47,843	55,382	Midway .....	.....	35
MAUI			KAUAI		
Lahaina	4,352	4,787	Waimea	5,714	7,987
Wailuku	7,953	11,742	Niihau	172	208
Hana	5,276	3,241	Koloa	4,564	5,769
Makawao	7,236	8,855	Kawaihau	3,220	2,580
	24,797	28,625	Hanalei	2,630	2,457
Molokai	3,123	1,791	Lihue	4,434	4,951
Lanai .....	.....	131	Total whole group	20,734	23,952
				154,001	191,909

Population in 1910 by Age, Groups, Sex and Race.

COLOR OR RACE	Under 21 yrs.		21 yrs. & over.		All ages.		
	Male	Female	Male	Female	Male	Female	Total
	5,513	5,404	7,926	7,198	13,439	12,602	26,041
Hawaiian	2,956	2,813	1,482	1,521	4,438	4,334	8,772
Caucasian-Hawn.	1,363	1,391	449	531	1,812	1,922	3,734
Asiatic-Hawn. ...	6,599	6,508	4,974	4,222	11,573	10,730	22,303
Portuguese	1,315	1,216	1,563	796	2,878	2,012	4,890
Porto Rican.....	610	569	468	343	1,078	912	1,990
Spanish	2,359	2,244	6,896	3,368	9,255	5,612	14,867
Other Caucasian..	3,453	2,930	13,695	1,596	17,148	4,526	21,674
Chinese	12,989	11,016	41,794	13,875	54,783	24,891	79,674
Japanese	400	306	3,531	296	3,931	602	4,533
Korean	191	196	224	84	415	280	695
Black and Mulatto	1,355	245	994	142	2,349	387	2,736
All Other	39,103	34,838	83,996	33,972	123,099	68,810	191,909

Population of Honolulu, various census periods.

1890.....	22,907	1896.....	29,926
1900.....	39,300	1910.....	52,183

Population of Honolulu and Hilo by Race and Sex, 1910.

From Tables of the Bureau of Census.

Race	Honolulu		Hilo	
	Male	Female	Male	Female
Hawaiian	3,969	3,941	369	295
Caucasian-Hawaiian	2,000	2,233	218	200
Asiatic-Hawaiian	653	727	98	122
Portuguese	3,042	3,105	552	586
Porto Rican.....	210	177	63	46
Spanish	141	117	37	30
Other Caucasian.....	5,627	3,573	382	295
Chinese	6,948	2,626	335	100
Japanese	7,659	4,434	1,699	1,080
Korean	352	108	26	1
Filipino	68	19	66	10
Negro	179	148	6	.....
All other	66	61	15	14
Total.....	30,914	21,269	3,866	2,879

Comparative Table of Population, Hawaiian Islands—
Census Periods 1860-1910.

Islands	1860	1866	1872	1878	1884	1890	1896	1900	1910
Hawaii..	21,481	19,808	16,001	17,034	24,994	26,754	33,285	46,943	55,382
Maui....	16,400	14,035	12,334	12,109	15,970	17,357	17,726	24,797	28,623
Oahu....	21,275	19,799	20,671	29,236	28,068	31,194	40,205	58,504	81,993
Kauai ...	6,487	6,299	4,961	5,634	*8,935	11,643	15,228	20,562	23,744
Molokai .	2,864	2,299	2,349	2,581	} 2614	2,652	2,307	2,504	1,791
Lanai ...	646	394	348	214		174	105	619	131
Niihau ..	647	325	233	177	.....	216	164	172	208
Kahoolawe.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Midway.....	.....	.....	.....	.....	.....	.....	.....	.....	35
Total..	69,800	62,959	56,897	57,985	80,578	89,900	109,020	154,001	191,909
All Foreigners	2,716	4,194	5,366	10,477	36,346	49,368	69,516	116,366	153,362
Hawaiians.....	67,084	58,765	51,531	47,508	44,228	40,622	39,504	37,635	35,547

The nationality of teachers in all schools of the Islands, June, 1915, was as follows: Hawaiian, 85; Part-Hawaiian, 205; American, 490; English, 57; Germans, 21; Portuguese, 86; Chinese, 44; Japanese, 36; Spanish, 1; other Foreigners, 24. Total, 1,049.

Population by Race and Sex, 1910, and per cent of change since 1900.

RACES	Total Populat'n	Native Born	Foreign Born	Males	Females	% Change
Hawaiian	26,041	26,041	.....	13,439	12,602	12.58 dec
Caucas'n-Hawn.	8,772	8,772	.....	4,448	4,334	{ 59.35 inc
Asiatic-Hawn.	3,734	3,734	.....	1,812	1,922	
Portuguese	22,303	13,766	8,537	11,573	10,730	42.28 "
Spanish	1,990	357	1,633	1,078	912	new
Porto Rican.....	4,890	4,830	.....	2,878	2,012	"
Other Caucas'n....	14,867	9,917	4,950	9,255	5,612	40.56 inc
Chinese	21,674	7,195	14,479	17,148	4,526	15.87 dec
Japanese	79,674	19,889	59,785	54,783	24,891	30.37 inc
Korean	4,533	362	4,171	3,931	602	
Black and Mulatto..	695	602	93	415	280	{ 146.03 "
All others	2,736	2,632	104	2,349	387	
Total.....	191,909	98,157	93,752	123,099	68,810	24.62 ^{Net} inc.

Illiterates in the Population Territory of Hawaii, 10 Years of Age and Over, Census of 1910.

Race	Per cent.	Race	Per cent.
All races	26.8	Spanish	49.6
Hawaiian	4.7	Other Caucasian	3.5
Caucasian-Hawaiian	1.3	Chinese	32.3
Asiatic-Hawaiian	1.8	Japanese	35.0
Portuguese	35.4	Korean	25.9
Porto Rican	73.2	Filipino and all other.....	32.4

The Census Bureau classes as illiterate any person ten years of age, or over, who is unable to write, regardless of ability to read.

Estimated Population, 1915, Territory of Hawaii, by Nationality.

From Board of Health Report.

Race	Number	Race	Number
American }		Part-Hawaiian	14,800
British }	25,600	Japanese	91,490
German }		Portuguese	23,650
Russian }		Porto Rican.....	5,080
Chinese	21,770	Spanish	4,210
Filipino	15,220	Others	5,270
Hawaiian	24,120	Total.....	231,210

Births and Deaths by Nationalities and Counties, 1915.

Nationality	Oahu				Hawaii		Maui		Kalawao		Kauai		TOTAL	
	Honolulu		Other Dist.		B	D	B	D	B	D	B	D	B	D
American..	169	74	14	8	12	7	10	2	.....	.....	1	205	92
British....	36	30	3	1	18	6	2	3	1	3	1	62	42	
Chinese....	398	153	38	22	68	41	45	28	3	23	29	592	276	
German....	11	14	2	....	5	3	2	....	.....	8	2	28	19
Hawaiian..	162	312	54	75	148	238	117	130	9	57	43	533	888	
Part Haw'n.	402	104	71	12	124	23	125	231	11	8	46	10	779	188
Japanese...	806	286	705	202	831	411	574	238	2	446	162	3,362	1,301
Portuguese.	192	110	78	26	290	92	176	55	1	129	19	865	303
Porto Rican	11	10	19	4	83	42	36	19	1	27	19	176	95
Spanish....	20	7	26	9	102	20	64	12	.....	53	4	265	52
Others....	7	15	35	35	87	72	29	32	.....	58	55	216	209
Filipino....	6	7	....	....	3	1	1	1	.....	3	...	13	9
Russian....	40	41	12	7	21	17	14	5	1	26	11	113	82
Total....	2,260	1,077	401	1,792	973	1,195	556	20	74	865	389	7,209	3,556	
Unrecorded	35	8	8	8	8	8	8	10	10	10	10	69	69	

Vital Statistics, Territory of Hawaii, 1915.

For Fiscal Year ending June, compiled from Board of Health Report.
Table of Births, Marriages and Deaths by Counties.

Islands, Etc.	Est. Popltn.	Births	Marriages	Deaths
Honolulu	64,150	2,295	1,865	1,163
Other Districts of Oahu County..	39,450	1,085	98	401
Hawaii County	63,550	1,800	343	973
Maui County	35,100	1,203	233	556
Kalawao County	740	20	15	74
Kauai County	28,220	875	146	389
Total, 1914-15	231,210	7,278	2,730	3,556
" 1913-14	227,391	6,756	3,149	3,707
" 1912-13	217,744	5,568	3,231	3,232
" 1911-12 .....	.....	5,147	2,882	3,071

Area, Elevation and Population of the Hawaiian Islands.

Islands	Area in Statute Square Miles	Acres	Height in Feet	Popltn. in 1910
Hawaii	4,015	2,570,000	13,825	55,382
Maui	728	466,000	10,032	28,623
Oahu	598	384,000	4,030	81,993
Kauai	547	348,000	5,250	23,744
Molokai	261	167,000	4,958	1,791
Lanai	139	86,000	3,400	131
Niihau	73	62,000	1,300	208
Kahoolawe	44	44,000	1,472	2
Midway .....	.....	.....	43	35

Total area of Hawaiian Islands, 6,405 miles.

The outlying islets on the N. W. may amount to 6 square miles.

School Statistics, Territory of Hawaii, 1915.

From Report of the Superintendent of Public Instruction.
NUMBER OF SCHOOLS, CLASS, ETC.

Islands	Public Schools June 30, 1915.					Private Schools Dec. 31, 1914.		
	No. of Schools	No. of Teachers	No. of Pupils			No. of Schools	Teachers No. of	No. of Pupils
			Boys	Girls	Total			
Hawaii.....	62	217	4,480	3,950	8,430	6	26	852
Maui, Molokai....	41	289	6,389	5,380	11,769	32	256	5,778
Kauai.....	47	128	2,475	2,048	4,523	6	29	986
Oahu.....	20	101	2,184	1,921	4,105	2	3	86
Totals.....	170	735	15,528	13,299	28,827	46	314	7,702

NUMBER OF SCHOOLS, TEACHERS AND PUPILS.

Class	Schools	Teachers			Pupils		
		M.	F.	Total	M.	F.	Total
Public Schools.....	170	139	596	735	15,528	13,299	28,827
Private "	46	124	190	314	4,268	3,434	7,702
Totals.....	216	263	786	1,049	19,796	16,733	36,529

AGES OF PUPILS IN PUBLIC AND PRIVATE SCHOOLS.

Schools	Under 6	6-9	10-15	Over 15	Total
Public Schools.....	177	13,103	14,522	1,075	28,827
Private "	1,386	1,823	3,299	1,194	7,702
Total.....	1,513	14,926	17,821	2,269	36,529

NATIONALITY OF PUPILS.

Races	Public	Private	Races	Public	Private
Hawaiian	3,203	663	Spanish	890	106
Part Hawaiian ..	3,158	1,336	Chinese	2,826	1,090
American	696	750	Japanese	11,557	1,996
British	88	52	Porto Rican.....	880	54
German	194	114	Korean	287	175
Portuguese	4,459	1,242	Russian	117	28
Filipinos	360	50	Other Foreigners.	112	46
			Total.....	28,827	7,702

Value Domestic Mdse. Shipments to the United States from Hawaii for Fiscal Years Ending June 30, 1914 and 1915.

Compiled from Monthly Summary of Commerce and Finance,
Bureau of Statistics.

Articles.	1914	1915
Animals	\$ 5,226	\$ 2,942
Art works, paintings, etc.....	315	10,810
Bones, hoofs, etc.....	2,119	7,615
Beeswax	12,525	13,633
Breadstuffs	11,450	11,653
Chemicals, drugs, etc.....	3,177	4,048
Coffee	657,853	486,054
Cotton and manufactures of.....	1,333	764
Fibers, unmanufactured—Sisal	59,915	52,608
Fish	1,008	.....
Fruits and nuts.....	4,783,583	6,189,203
Hides and skins.....	178,926	210,460
Honey	33,992	35,536
Household and personal effects.....	6,500	23,088
India rubber, crude.....	2,743	1,705
Meat products, tallow	8,087	12,135
Molasses	149,597	195,485
Musical instruments	10,419	17,528
Paper and manufactures of.....	1,737	1,596
Pineapple juice	68,936	43,030
Rice	178,310	131,597
Straw and palm leaf, manufactures of.....	1,187	819
Sugar, brown	32,106,011	51,368,995
Sugar, refined	1,079,909	1,580,702
Tobacco leaf, unmanufactured.....	1,277	26,832
Vegetables	11,378	12,823
Wood and manufactures of.....	61,708	56,916
Wool, raw	77,214	70,971
All other articles.....	20,078	41,387
Total value shipments Hawaiian products.....	\$39,538,513	\$60,610,935
Returned shipments merchandise.....	1,089,687	1,220,446
Shipments foreign merchandise.....	50,380	255,869
Total to United States.....	\$40,677,580	\$62,087,250

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Shipments foreign merchandise.....	50,380	255,869
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Import Values from United States, Comparative, for Fiscal Years Ending June, 1914 and 1915.

Compiled from Monthly Summary of Commerce and Finance,
Bureau of Statistics.

Articles.	Domestic Merchandise	
	1914	1915
Agricultural Implements	\$ 31,173	\$ 18,426
Animals	262,826	163,995
Automobiles, and parts of.....	841,458	971,795
Books, Maps, Engravings, etc.....	182,831	228,824
Boots and Shoes.....	367,107	346,638
Brass, and manufactures of.....	77,144	46,420
Breadstuffs	2,221,197	2,479,349
Brooms and Brushes.....	28,661	22,175
Carriages, Cars, etc., and parts of.....	294,015	218,984
Cement	266,090	176,162
Chemicals, Drugs, Dyes, etc.....	384,501	345,352
Clocks, Watches, and parts of.....	20,252	7,035
Coal	65,017	15,460
Cocoa and Chocolate.....	39,067	40,440
Coffee, prepared	7,444	3,582
Copper, and manufactures of.....	98,232	20,736
Cotton, manufactures of, and clothing.....	1,981,843	1,253,162
Earthen, Stone and Chinaware.....	92,710	54,282
Eggs	62,462	65,424
Electrical Machinery and Instruments.....	567,181	323,040
Explosives	925,963	259,666
Fertilizers	684,966	740,861
Fibers, Textile Grasses, manufactures of.....	148,077	180,619
Fish	314,968	325,240
Fruits and Nuts.....	385,100	384,518
Furniture of Metal.....	65,478	23,139
Glass and Glassware.....	174,953	104,494
Hay	295,525	216,282
Household and Personal Effects.....	136,624	102,668
India Rubber, manufactures of.....	530,253	601,784
Instruments, etc., for scientific purposes.....	21,432	6,560
Iron and Steel and manufactures of.....	79,122	34,750
Sheets and Plates, etc.....	139,652	18,668
Builders' Hardware, etc.....	737,844	126,593
Machinery, Machines, parts of.....	1,021,746	446,448
Nails, Spikes, Pipes, etc.....	2,506,695	908,797
Jewelry and manufactures, Gold and Silver.....	92,313	152,509
Lamps, Chandliers, etc.....	24,598	13,339
Lead and manufactures of.....	72,293	57,365
Leather and manufactures of.....	218,062	336,991
Marble, Stone and manufactures of.....	24,031	14,317
Musical Instruments	53,531	50,305
Naval Stores	11,702	7,257
Oil Cloth	13,177	3,583

Import Values from United States for 1914-15—Continued.

Articles.	Domestic Merchandise	
	1914	1915
Oils: Mineral, Crude	922,630	1,198,599
Refined, etc.	1,030,795	762,800
Vegetable	61,252	65,215
Paints, Pigments and Colors.....	211,403	239,350
Paper and manufactures of.....	405,881	305,449
Perfumery, etc.	35,253	17,454
Phonographs, etc.	36,527	39,353
Photographic Goods	96,913	98,404
Provisions, etc., Beef Products.....	24,598	23,746
Hog and other Meat Products.....	548,169	562,178
Dairy Products	562,516	582,811
Rice	216,252	39,755
Salt	24,210	23,105
Silk and manufactures of.....	103,584	92,161
Soap; Toilet and other.....	186,003	151,745
Spirits, etc., Malt Liquors.....	248,017	223,969
Spirits, distilled	173,850	147,425
Wines	358,494	311,222
Starch	15,647	6,305
Straw and Palm Leaf, manufactures of.....	80,131	52,613
Sugar, Molasses and Syrup.....	82,409	104,959
Confectionery	91,933	84,908
Tin and manufactures of.....	93,180	31,742
Tobacco, manufactures of.....	740,851	743,902
Toys	57,770	40,114
Varnish	9,796	.....
Vegetables	434,460	387,473
Wood and manufactures of—		
Logs and round timber.....	8,615	.....
Lumber, Shingles, etc.....	876,544	831,837
Doors, Sash, Blinds and all other.....	294,548	567,655
Furniture	203,615	125,926
Wool and manufactures of.....	186,946	138,338
All other articles.....	603,271	482,839
Total domestic merchandise.....	\$25,571,169	\$20,295,829
Total value foreign merchandise from U.S.	202,243	404,179

Hawaii's Commerce with U. S. and Foreign Countries.

Total Import with Export Values for 1914 and 1915.

Compiled from Monthly Summary of Commerce and Finance,
Bureau of Statistics.

Countries.	Imports.		Exports.	
	1914	1915	1914	1915
Austria-Hungary	\$ 608	\$ 3,421	\$.....	\$.....
Belgium	47,466	353	8,618	403
Canada	21,677	43,614	88,525	15,616
Great Britain	468,006	361,490	70,026	116,446
Germany	696,197	230,483	118,755	6,304
France	15,524	12,983	27,839	.....
Italy	1,832	2,747	333	.....
Netherlands	10,317	11,863	10,225	1,497
Norway	3,042	2,030	.....	.....
Portugal	2,884	2,519	.....	.....
Switzerland	396	249	.....	.....
Sweden	5,175	2,527	.....	.....
Chile	332,310	464,581	12	.....
China	8,910	42,563	5,614	5,380
East Indies	957,320	600,404	1,523	419
Hong Kong	369,887	347,450	23,761	5,302
Japan	2,516,463	2,575,798	20,491	23,357
Australasia	615,046	861,637	4,857	7,220
Oceania	84,820	32,537	14,682	9,376
Korea	2,353	278	120	63
Philippines	121,078	114,336	518,008	179,345
United States*	25,773,412	20,700,008	40,678,580	62,087,250
All other	1,247	2,160	1,856	6,781
Total.....	\$32,055,970	\$26,416,031	\$41,593,825	\$62,464,759

* Not including coin shipments.

Exports and Imports for Fiscal Year Ending June 30, 1915.

Exports—Domestic produce to United States.....	\$61,831,381
Foreign produce to United States.....	255,869
Coin shipments to United States.....	481,435
Domestic produce to Foreign Countries.....	361,118
Foreign produce to Foreign Countries.....	16,391

Total export value..... \$62,946,194

Imports—Domestic produce from United States.....	\$20,295,828
Foreign produce from United States.....	404,179
Coin shipments from United States.....	1,777,200
Produce from Foreign Countries.....	5,716,025

Total import value..... \$28,193,221

**Quantity and Value of Principal Articles of Domestic Produce
Shipped to U. S. for the Fiscal Year Ending June 30, 1915.**

Compiled from Monthly Summary of Commerce and Finance,
Bureau of Statistics.

Articles		Quantity	Value
Sugar, raw	pounds ..	1,253,668,612	\$51,368,995
Sugar, refined	" ..	27,195,200	1,580,702
Coffee, raw	" ..	3,191,274	486,054
Rice	" ..	3,030,720	131,597
Fibers, sisal	tons ..	474	52,608
Fruits: Fresh Bananas	bunches ..	230,144	147,021
Fresh Pineapples .....	.....	.....	52,928
Canned Pineapples .....	.....	.....	5,986,190
All other .....	.....	.....	427
Pineapple Juice .....	.....	.....	43,030
Beeswax	pounds ..	51,844	13,633
Honey .....	.....	.....	35,536
India Rubber, crude	pounds ..	2,785	1,705
Molasses	gallons ..	5,202,913	195,485
Hides and Skins	pounds ..	1,333,748	210,460
Wool, raw	" ..	329,465	70,971
Timber, lumber & unmnfrd wood .....	.....	.....	10,239

Domestic Exports to Foreign Countries for Fiscal Year 1915.

Articles		Quantity	Value
Sugar, refined	pounds ..	53,623	\$ 3,402
Coffee, raw	" ..	1,172,332	165,853
Rice	" ..	14,400	699
Fruits and Nuts .....	.....	.....	130,097
Other .....	.....	.....	61,067
Total .....	.....	.....	\$ 361,118

Summary of Insurance Business, Territory of Hawaii, for 1914.

From Report of Insurance Commissioner.

Class	Amount Written	Amount Premiums	Losses and Claims paid
Fire	\$29,632,953.11	\$ 558,888.90	\$ 64,762.95
Marine	65,675,107.37	290,537.93	14,592.15
Life	2,007,427.00	711,625.46	142,463.41
Accident and Health .....	.....	28,894.44	7,748.53
Automobile .....	.....	24,496.12	9,304.63
Surety and Fidelity .....	.....	30,678.09	3,958.73
Employers' Liability .....	.....	24,151.98	4,067.03
Plate Glass .....	.....	2,220.27	835.20
Burglary .....	.....	364.45	70.00
Other .....	.....	2,035.68	225.17
Total	\$97,315,487.48	\$ 1,673,893.32	\$ 248,027.80

* Of this amount \$631,053.11 is renewals.

Number and Tonnage of Vessels Entering and Clearing at all Ports, District of Hawaii, 1915.

[Not including Transports and bunker coal vessels.]

Ports	Entered		Cleared	
	Vessels	Tons	Vessels	Tons
Honolulu	—Coastwise.....	261	941,335	274
	Foreign.....	145	610,259	105
Hilo	—Coastwise.....	16	15,028	21
	Foreign.....	1	1,111	4
Kahului	—Coastwise.....	12	19,332	12
	Foreign.....	4	4,565	...
Koloa	—Coastwise.....	3	1,304	9
	Foreign.....	4	4,609	...
Mahukona	—Coastwise.....	9	7,371	11
	Foreign.....	1	1,011	...
Total.....	456	1,605,925	436	1,574,845

Value Carrying Trade to and from District of Hawaii, 1915.

Nationality	Imports	Exports
American	\$22,772,632	\$62,306,507
British	1,001,908	41,280
French	1,560	...
German	271,379	1,517
Japanese	1,774,409	19,052
Norwegian	173,385	...
Dutch	4,125	...
All other	65,457	...
Total.....	\$26,064,855	\$62,368,356

Value of Imports from Foreign Countries, 1915.

Bags	\$ 465,445	Food Supplies	\$2,142,331
Cement	32,961	Iron and Steel.....	33,459
Chemicals	961,393	Spirits	157,945
Coal	340,732	Miscellaneous	1,299,285
Cottons	153,733	Total.....	\$5,716,023
Fertilizers	128,739		

Hawaiian Sugar Export Statistics from 1901.

For earlier years see Annuals 1896-1914.

Year	Sugar		Molasses		Ttl. export Value
	Pounds	Value	Gallons	Value	
1901	690,882,132	\$27,094,155	93,820	\$ 4,615	\$27,098,770
1902	720,553,357	23,920,113	48,036	2,187	23,922,300
1903	774,825,420	25,310,684	10	1	25,310,685
1904	736,491,992	24,359,385	11,187	712	24,360,097
1905	832,721,637	35,112,148	26,777	1,282	35,113,430
1906	746,602,637	24,495,427	3,180	177	24,495,604
1907	822,014,811	27,692,997	6,917	355	27,693,352
1908	1,077,570,637	39,816,062	23	20	39,816,082
1909	1,022,863,927	37,632,742	728	79	37,632,821
1910	1,111,594,466	42,625,062	100	7	42,625,069
1911	1,011,215,858	36,704,656	1,801,796	89,708	36,794,364
1912	1,205,465,510	49,961,509	1,734,318	77,241	50,038,750
1913	1,085,362,344	36,607,820	3,736,877	140,610	36,748,430
1914	1,114,750,702	33,187,920	4,110,404	149,597	33,337,517
1915	1,280,917,435	52,953,009	5,202,913	195,485	53,148,594

Passengers To and From Hawaii, Fiscal Year 1915.

Courtesy Board Immigration, Labor and Statistics.

Nationality	Arrivals			Departures		
	Cabin	Steer-age	Total	Cabin	Steer-age	Total
Chinese	162	385	547	83	645	728
Japanese	176	3,180	3,356	144	3,449	3,593
Filipinos	1	1,244	1,245	1	678	679
Koreans	1	51	52	8	24	32
Portuguese	112	112	.....	.....	469	469
Spaniards	24	24	.....	.....	447	447
Russians	17	17	.....	.....	80	80
Hindus	1	3	4	1	2	3
Porto Ricans	7	7	.....	.....	50	50
All Others	649	649	.....	.....	762	762
Europeans	6,564	88	6,652	6,621	91	7,712
Total	6,905	5,760	12,665	6,858	6,697	13,555

Territorial Taxes Collected During Calendar Year 1914.

Courtesy of J. H. Fisher, Auditor.

Real Estate	\$1,091,450.22	School Tax	\$ 102,856.57
Personal Property . . .	838,488.78	10% Penalty	2,054.05
Bicycles and Tags . . .	3,900.20	Court Costs and Int..	5,759.40
Automobiles	36,386.95	Dog and Dog Tags . . .	5,297.84
Carriages, Carts, etc..	27,382.05	Advertising Costs . . .	121.45
Brakes and Sulkies . . .	2,164.00	Income Tax	302,969.78
Road Tax	103,634.49	Special Income Tax . . .	129,306.53
Poll Tax	51,529.04	Total	\$2,703,301.35

Hawaii's Annual Trade Balance, etc., from 1901.

Year	Imports	Exports	Excess export Values	Custom house Receipts
1901	\$24,964,693	\$29,342,697	\$ 4,378,003	\$ 1,264,862
1902	22,036,583	24,793,735	2,757,152	1,327,518
1903	13,982,485	26,275,438	12,292,953	1,193,677
1904	15,784,691	25,204,875	9,420,184	1,229,338
1905	14,718,483	36,174,526	21,456,043	1,043,340
1906	15,639,874	26,994,824	11,354,950	1,218,764
1907	18,662,434	29,303,695	10,641,261	1,458,843
1908	19,757,270	42,241,921	22,484,651	1,550,157
1909	22,241,041	42,281,777	20,040,736	1,396,379
1910	26,152,435	47,029,631	20,877,196	1,450,324
1911	28,065,626	42,666,197	14,600,571	1,654,761
1912	28,694,322	55,449,438	26,755,116	1,643,197
1913	37,519,620	43,471,830	5,952,210	1,869,513
1914	31,550,257	41,594,072	6,043,815	1,184,416
1915	26,416,031	62,464,759	36,048,728	1,019,534

Receipts, Expenditures, and Public Debt of Hawaii, from 1901.

(From Official Reports.)

Years	Revenue	Expenditures	Cash Balance in Treasury	Public Debt
1901	2,140,297.36	2,576,685.53	75,994.97	939,970.31
1902	2,473,172.81	2,382,968.90	287,131.30	1,093,970.31
1903	2,387,715.88	2,603,194.20	73,181.63	2,185,000.00
1904	2,415,356.33	2,844,054.81	56,613.29	3,317,000.00
1905	2,354,783.37	2,240,731.55	59,408.49	3,861,000.00
1906	3,320,998.90	2,512,675.89	335,331.37	3,818,000.00
1907	2,716,624.00	2,665,845.74	348,216.51	3,718,000.00
1908	2,551,522.21	2,508,001.51	391,737.19	3,979,000.00
1909	3,051,526.81	3,160,875.81	453,106.76	3,959,000.00
1910	3,641,245.35	3,435,082.87	845,218.51	4,079,000.00
1911	3,482,560.84	3,730,765.16	822,282.07	4,004,000.00
1912	3,963,588.55	4,002,483.00	2,327,844.00	5,454,000.00
1913	4,300,780.71	4,261,468.66	2,279,088.88	6,844,000.00
1914	3,925,187.95	4,263,863.64	1,286,315.57	6,844,000.00
1915	4,539,241.04	4,446,415.65	2,136,912.50	7,873,500.00

Hawaii's Bonded Debt, June 30, 1915.

Public Improvement 4½% Bonds 1903.....	\$ 850,000
Public Improvement 4¼% Bonds, 1905.....	1,000,000
Refund Bonds, 1905, 4%.....	600,000
Public Improvement 3½% Bonds.....	1,244,000
Public Improvement 4% Bonds.....	4,179,500

Total Bonds Outstanding..... \$7,873,500

**Assessed Values Real and Personal Property for 1915,
by races of tax-payers.**

Courtesy Treasury Department.

Taxpayers	Real Estate		Personal Property	
	No. Tax payers	Assessed Value	No. Tax payers	Assessed Value
Corporations, firms, etc.	800	\$57,531,821	794	\$66,930,707
Anglo-Saxons	3,200	20,971,922	2,206	3,365,505
Hawaiians	5,741	13,701,943	1,855	1,477,088
Chinese	889	2,084,356	1,928	2,224,647
Japanese	845	1,002,203	2,491	2,823,015
Portuguese and Spanish	2,332	3,894,078	1,499	593,937
Total.....	13,807	\$99,186,323	10,773	\$77,414,899

Hawaiian Corporations, 1915.

Courtesy of Treasury Department.

Class.	Total No.	Number and Capital Incorporated before and after Aug. 12, 1898				Total
		No.	Before	No.	After	
Agriculture ..	178	64	\$44,835,750	114	\$36,073,850	\$ 80,909,600
Mercantile ..	566	85	22,825,625	481	45,333,068	68,161,693
Railroad	12	5	7,370,000	7	9,750,000	17,120,000
Street Car....	2	....	.....	2	1,200,000	1,200,000
Steamship ...	1	1	2,250,000	....	.....	2,250,000
Bank	5	1	600,000	4	1,300,000	1,900,000
Savs. & Loan	13	1	1,000,000	12	745,000	1,745,000
Trust	6	1	200,000	5	700,000	900,000
Insurance ...	4	....	.....	4	900,000	900,000
Eleemosynary	148	34	.....	114	.....	.....
Total.....	935	192	\$79,084,375	743	\$96,001,918	\$175,086,293

**Nationality of Plantation Labor, June 30, 1915, and
June 30, 1914.**

Courtesy Bureau of Labor and Statistics, Hawaiian Sugar Planters' Ass'n.

	1915	1914		1915	1914
Americans	650	624	Japanese	23,973	24,694
Spanish	1,485	1,714	Chinese	2,139	2,123
Portuguese	3,643	3,611	Koreans	1,286	1,365
Russians	93	73	Filipinos	8,243	9,258
Hawaiians	992	979	Others	297	312
Porto Ricans.....	1,448	1,460	Total.....	44,299	46,213

Taxes by Division and Counties for the fiscal year ending June 30, 1915.

Courtesy of J. H. Fisher, from Auditing Department Report.

DIVISION OF TAXES	OAHU.	MAUI.	HAWAII.	KAUAI.	TOTALS.
Special Territorial Taxes.....	\$ 26,893.10	\$.....	\$.....	\$.....	\$ 26,893.10
Real Estate Taxes.....	606,602.60	228,254.81	259,941.29	105,820.05	1,200,618.75
Personal Property Taxes.....	442,240.00	142,470.52	203,469.29	113,158.95	901,338.76
Bicycles and Tags.....	2,785.05	130.90	763.55	268.40	3,947.90
Automobiles	31,478.45	5,699.40	8,766.00	5,618.65	51,562.50
Carriages, Carts, &c.	12,954.30	3,555.00	6,850.00	3,830.00	27,189.30
Brakes and Sukies.....	600.00	192.00	698.00	384.00	1,874.00
Road Tax.....	39,018.74	18,531.15	29,604.15	17,206.70	104,360.74
Poll Tax.....	19,218.80	9,226.09	14,774.84	8,582.35	51,802.08
School Tax.....	38,397.91	18,451.46	29,441.03	17,165.25	103,455.65
Dog and Dog Tags.....	1,990.74	526.62	2,248.43	519.55	5,285.34
10% Penalty.....	1,516.30	170.16	353.11	22.70	2,062.27
Court Costs and Interest.....	4,535.44	578.58	560.50	41.30	5,715.82
Advertising Costs.....	68.00	14.50	10.50	.....	93.00
Income Tax.....	309,904.14	32,815.02	18,732.18	11,897.75	373,349.09
Special Income Tax.....	139,869.60	15,072.92	6,030.80	4,551.40	165,524.72
Total.....	\$1,678,073.17	\$475,689.13	\$582,243.67	\$289,067.05	\$3,025,073.02

SUMMARY OF METEOROLOGICAL OBSERVATIONS, HONOLULU, 1914-15.

Compiled from U. S. Weather Bureau Records, by A. M. Hamrick, Meteorologist.

(Continued from preceding Annuals.)

MONTH	BAROMETER		RAIN-FALL		REL. HUM.		TEMPERATURE		MEAN TEMPERATURE			Cloud Amt.	Wind Velocity
	8 a.m.	8 p.m.	8 a.m.	8 p.m.	Max.	Min.	6 a.m.	2 p.m.	9 p.m.	Mean of Max. and Min.			
July	29.99	29.98	0.42	67	72	70	75.2	81.5	76.3	78	4.0	8.9	
August	29.99	29.97	0.35	67	72	86	76.0	81.4	76.8	78	5.0	10.0	
September	29.97	29.96	2.15	71	72	87	75.9	80.6	77.0	78	6.4	9.5	
October	30.02	30.01	1.17	65	71	83	67	73.6	79.7	75.1	75	3.7	8.3
November	30.03	30.01	1.46	69	72	83	65	71.4	77.2	72.9	74	4.4	8.4
December	29.94	29.91	4.37	72	74	80	61	67.6	74.3	69.7	70	5.2	7.1
January	30.05	30.02	0.35	66	66	80	58	67.4	74.0	68.9	69	3.9	8.9
February	30.11	30.09	0.82	66	66	84	58	66.2	72.4	68.3	71	6.0	9.3
March	30.08	30.05	0.42	65	69	80	61	67.5	74.8	89.6	70	3.7	7.6
April	30.05	30.03	1.93	69	74	82	62	68.6	75.8	70.9	72	5.0	8.4
May	30.01	30.00	0.20	66	71	85	67	72.6	79.9	74.6	76	3.4	7.1
June	30.02	30.00	0.86	63	68	86	70	74.0	80.4	76.0	78	3.5	8.2
Year	30.02	30.00	14.50	67.2	70.6	83.4	65.0	71.3	77.7	73.0	74.1	4.5	8.5

—1915—

TABLE OF RAINFALL, Principal Stations.

Compiled from Weather Bureau Reports.

Stations	Observer	1914					
		July	Aug.	Sept.	Oct.	Nov.	Dec.
HAWAII							
Waiakea.....	D. Forbes.....	19.96	35.50	24.38	8.69	16.77	13.24
Hilo (Town).....	L. C. Lyman.....	25.45	28.21	24.06	11.46	18.26	13.90
Ponahawai.....	J. E. Gamalielson	13.41	42.81	33.09	10.39	22.49	15.14
Pepeekeo.....	Pepeekeo S. Co.	19.02	29.75	28.15	8.20	15.59	10.36
Hakalau.....	W. F. Klatt.....	17.88	37.21	28.31	11.92	18.27	11.58
Laupahoehoe.....	E. W. Barnard..	27.30	35.83	25.86	8.34	18.47	10.43
Ookala.....	Kaiwiki S. Co...	30.66	38.69	20.40	8.30	18.40	11.13
Kukaiau.....	F. F. Bechert....	25.87	31.34	17.54	6.12	17.60	9.55
Paauhau.....	L. Wilson.....	19.62	25.90	9.05	3.99	16.39	9.23
Honokaa.....	H. R. Sims.....	19.45	24.66	7.47	4.37	14.98	9.35
Waimea.....	F. Pinho.....	7.44	9.61	4.68	3.54	7.52	11.03
Kohala.....	Dr. B. D. Bond..	12.72	19.88	7.04	5.09	11.91	8.49
Holualoa.....	Jno. Gabeler....	5.73	8.16	9.14	0.63	6.38	7.75
Kealakekua.....	Rev. S. H. Davis.	3.16	9.04	9.35	0.59	4.58	10.31
Naalehu.....	C. H. White....	4.54	6.40	4.50	3.12	7.36	7.58
Pahala.....	Haw. Agr. Co...	7.82	5.98	3.81	0.75	4.66	9.53
Volcano House....	D. Lycurgus....	28.85	16.53	17.80	8.10	14.67	8.18
Olaa (17 miles)....	Olaa Sugar Co..	41.15	45.98	44.02	12.61	25.51	15.98
Kapoho.....	H. J. Lyman....	11.31	20.44	15.43	5.46	12.08	27.73
MAUI							
Haleakala Ranch.	L. von Tempsky.	2.86	3.70	2.76	0.96	8.95	11.98
Puuomalei.....	A. McKibbin...	8.78	11.71	10.34	9.84	14.81	14.91
Makawao.....	F. W. Hardy....	3.31	5.40	4.24	4.36	8.73	9.30
Kula.....	Geo. Copp.....	4.62	2.96	6.26	0.07	1.02	9.24
Haiku.....	Mrs. L.B. Atwater	9.72	10.88	8.07	6.00	8.78	8.65
Keanae Valley...	W. F. Pogue...	19.60	22.83	27.37	10.36	14.66	15.38
Nahiku.....	Nahiku Rub. Co.	21.95	28.05	33.51	10.62	16.14	20.10
Wailuku.....	Bro. Frank.....	0.89	3.04	2.12	0.59	2.95	7.76
Hana.....	Geo. O. Cooper.	3.28	5.86	26.82	3.70	6.07	17.85
OAHU							
Honolulu.....	U. S. Weath. Bu.	0.42	0.35	2.15	1.17	1.46	4.37
Kinau Street.....	W. R. Castle...	0.54	0.32	2.05	1.46	1.94	4.70
Manoa.....	C. S. Desky....	16.49	8.71	12.80	4.34	6.81	8.52
Nuuanu Ave.....	D. Stanley.....	2.24	....	4.47	2.52	3.25	5.95
Electric Lt. St....	A. Walker.....	7.86	6.93	15.92	4.64	9.24	8.43
Luakaha.....	L. A. Moore....	20.32	14.29	32.75	5.55	13.12	10.46
Waimanalo.....	Ed. Todd.....	0.52	0.45	2.73	0.93	2.36	7.07
Maunawili.....	Jno. Herd.....	7.51	5.22	20.12	2.98	7.74	8.97
Ahuimanu.....	H.R. Macfarlane	7.44	3.98	20.92	4.51	....	....
Kahuku.....	R. A. MacMillan	3.92	1.76	6.17	1.19	0.23	5.86
Ewa Plantation..	I. A. Hattie....	0.51	0.27	2.12	0.00	1.21	2.74
Schofield Brks....	J. H. Duvall....	1.50	0.96	4.98	0.69	0.71	7.01
Waiawa.....	A. Lister.....	2.44	1.37	6.41	2.66	2.97	4.13
Waimalu.....	Hon. Plan. Co..	0.72	0.87	4.22	1.26	3.18	3.86
KAUAI							
Grove Farm.....	G. N. Wilcox...	2.77	2.39	21.54	1.43	4.20	4.68
Kealia.....	Makee Sgr. Co.	1.71	1.02	18.36	1.35	2.07	6.26
Kilauea.....	L. B. Boreiko...	7.15	4.74	27.30	3.31	5.98	11.86
Eleele.....	McBryde S. Co..	0.53	0.72	9.81	0.51	1.51	4.28
Kukuiula.....	F. L. Zoller....	1.15	1.85	13.36	1.40	2.60	4.10
Waiawa.....	G. Andreson....	0.10	0.00	10.50	0.00	0.00	10.13

TABLE OF RAINFALL.

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Throughout the Hawaiian Islands, 1914-1915.

By A. M. Hamrick, Section Director. Continued from last Annual.

Locality	Ft. Elv.	1915						
		Jan.	Feb.	Mar.	Apr.	May	June	Year
HAWAII								
Waiakea	50	3.17	8.53	2.36	21.47	4.85	8.96	167.88
Hilo	100	3.36	9.23	2.62	21.90	3.87	9.18	171.53
Ponahawai	500	4.17	10.93	4.37	21.17	4.75	9.96	192.68
Pepeekeo	100	3.98	7.20	2.74	21.17	3.26	10.71	160.13
Hakalau	200	4.11	9.31	3.78	22.41	3.15	10.41	178.34
Laupahoe	100	6.51	10.25	5.85	12.13	3.67	6.76	171.40
Ookala	400	7.52	10.92	5.56	17.33	4.22	7.00	180.13
Kukaiu	250	4.67	6.91	4.49	12.63	2.57	5.12	144.41
Paaahu Mill.....	300	2.98	8.27	2.91	11.62	2.45	4.98	117.39
Honokaa	470	3.51	9.05	4.04	13.44	2.63	5.52	118.47
Waimea	2720	1.53	4.56	1.76	3.04	3.41	3.35	61.47
Kohala Mission.....	521	3.09	5.25	2.27	7.97	1.69	2.53	87.93
Holualoa	1350	0.03	0.49	1.39	1.90	3.88	9.02	54.50
Kealakekua	1580	0.27	0.69	1.50	1.99	6.96	11.17	59.61
Naalehu	650	0.03	2.07	0.20	3.06	1.47	2.74	43.07
Pahala	850	0.11	1.63	2.01	6.03	0.87	2.60	45.80
Kilauea Crater.....	4000	0.00	1.40	1.82	8.39	2.71	6.03	114.48
Olaa, Puna.....	1530	4.59	11.58	3.67	22.91	6.48	12.41	246.89
Kapoho	110	2.91	3.28	1.43	9.56	4.46	5.12	119.21
MAUI								
Haleakala Ranch....	2000	1.91	4.85	2.25	14.50	2.50	0.74	57.96
Puuomalei	1400	3.50	12.69	2.21	10.80	1.88	4.03	105.40
Makawao	1700	3.69	5.22	2.47	7.44	1.78	2.54	58.48
Erehwon	4000	0.15	0.43	0.68	1.46	1.57	....	....
Haiku	700	3.11	7.21	3.88	8.72	1.27	4.16	80.25
Keanae	1000	5.61	26.78	10.37	31.63	8.26	20.95	213.80
Nahiku	800	4.08	11.52	....	....	8.65	14.98	....
Wailuku	250	0.52	1.43	0.70	3.54	0.60	0.47	24.61
Hana	145	1.76	9.53	0.78	35.84	2.02	3.65	117.16
OAHU								
U. S. Weather Bu...	108	0.35	0.82	0.42	1.93	0.20	0.86	14.50
Kinau Street.....	50	0.29	0.99	....	1.74	0.20	0.54	....
Woodlawn	300	1.11	9.57	3.26	17.81	2.54	6.71	98.67
Nuuau Avenue.....	50	....	....	....	....	....	....	....
Nuuau Elec. Stn...	405	0.97	6.10	3.15	13.64	2.08	5.69	84.65
Nuuau Water Wks..	850	2.18	11.45	5.08	25.46	5.91	10.01	156.58
Waimanalo	25	0.80	1.43	1.29	10.73	1.74	1.13	31.18
Maunawili	250	2.30	5.05	2.78	16.54	4.03	5.10	88.34
Ahuimanu	350	....	....	....	....	....	....	....
Kahuku	25	....	....	....	....	0.40	2.80	....
Ewa	50	0.21	0.21	0.45	1.28	0.35	0.24	9.59
Leilehua	990	0.91	1.92	2.89	4.04	2.16	3.75	31.52
Wahiawa	675	1.14	2.44	1.54	3.00	3.74	4.24	36.08
Ewa	200	0.41	1.47	0.64	2.12	3.01	1.86	23.62
KAUAI								
Lihue	200	0.69	2.39	0.60	4.01	1.97	4.12	50.79
Kealia	15	0.00	0.98	0.55	3.87	0.25	2.61	38.03
Kilauea	342	0.73	2.09	1.56	9.13	4.34	5.63	83.82
Eleele	150	0.25	0.35	1.09	2.12	0.19	1.20	23.56
Koloa	100	0.10	1.90	1.35	3.05	0.15	3.45	34.46
Waimea	30	0.30	0.00	0.97	1.12	0.00	0.46	23.58

COMMERCIAL REVIEW, 1915.

ANOTHER year of substantial progress in Hawaii's commerce is shown by the Customs tables covering imports and exports for the fiscal year ending June 30, 1915, on pages 21 to 25 inclusive. In several features it proves to be Hawaii's record year and is well worthy of analysis for due appreciation of the facts and figures they represent; hence this brief review.

In the first place, the aggregate value of merchandise passing in and out of the Territory, including specie, is \$91,139,425, a gain on the previous banner year (1912) of \$6,995,665. A comparison of the outward and inward values of these record years, however, reveal more congratulatory grounds, for while the excess of export values over that of imports in 1912 showed \$26,755,116 to our credit, we have for 1915 the nice little sum of \$36,048,728. If to this sum is added the reduction in value of imports from that of 1914, which was \$5,639,939, the benefit for our year's commercial transactions shows \$41,687,667.

Segregated, the total export values, including specie, amount to \$62,946,194, a gain over the previous year of \$20,186,189, while the value of total imports, including specie, is \$28,193,231.

Of the above total exports but \$377,509 represent the value of all shipments to foreign countries, the mainland absorbing practically our entire export trade.

The sugar industry and the improved market conditions for same throughout the year has given liberally toward this benefit, as per the following comparative showing:

	1915.		1914.	
	Quantity.	Value	Quantity.	Value.
Raw sugar, lbs.....	1,253,661,612	\$51,368,612	1,089,379,128	\$32,108,011
Refined " "	27,195,200	1,580,702	25,371,574	1,079,909
Molasses, gals.....	5,202,913	195,485	4,110,404	149,597
Total.....		\$53,145,182		\$33,337,517

These figures prove another banner year for our main products.

uct, both in quantity and value, exceeding the previous record year, which was in 1912 with 1,205,465,510 lbs. sugar, and with the molasses exports gave a value of \$50,038,750, thus leaving a gain of \$3,106,432 over our former best year's output.

The pineapple industry exports also show improvement as a whole, though the fresh fruit and juice fell far behind the shipments of 1914, as shown in the following comparative table of values:

	1914.	1915.	
Fresh pineapples.....	\$ 115,754	\$ 52,928	a decline of \$ 62,817
Canned ".....	4,536,919	5,986,190	a gain of 1,449,271
Pineapple juice.....	68,936	43,030	a drop of 25,906
Total.....	\$4,721,600	\$6,082,148	a net gain of \$1,360,548

Other items of domestic produce sharing in this improved condition were: Bananas, which increased from 197,910 bunches, valued at \$125,904 in 1914 to 230,144 bunches this last year, valued at \$147,021. Hides and skins gained \$31,534. Tobacco also gained \$25,555, and Aviary products \$2,652.

Rice and Coffee both show a decline, as does also Sisal, in value, though 17 tons more of this fiber were exported in 1915 than the year before. Wool, as also Koa, and Ohia, are in the shortage list.

The table of imports in their comparative setting (pages 22-23) are worthy of examination for a knowledge of market conditions. The total value of all imports, including specie, for the year 1915 is \$28,193,231, as per summarized table on page 24.

The various lines or class of imports do not show very marked differences in value, the decline being in a few important products, indicating a temporary lull, or an already well-supplied market. Lines indicating this condition are of the constructive class, notwithstanding the prevailing building activity. In the one line of Iron and Steel the falling-off is \$2,949,803. Cement has fallen off \$46,500; Copper and manufactures, some \$48,000; Electrical machinery \$244,000; Explosives \$666,297.

Breadstuffs vary little in total values for three years past, ranging in the neighborhood of \$2,500,000 per annum; Fruits

and nuts range from \$372,000 to \$385,000 per year; Meat and dairy products likewise indicate little change, its limits the past three years being from \$1,135,283 to \$1,342,769.

In the line of cotton goods, cloths, wearing apparel and manufactures, a more fluctuating condition prevails, their total value in 1913 being \$2,577,285, which fell off to \$1,981,843 in 1914 and reduced again in 1915 to \$1,253,162, a reduction of over 50% in two years. Woolen manufactures likewise show a steady decline in yearly imports, the total values for 1913-14-15 being, respectively, \$930,622, \$753,361, and \$621,177. Furniture imports for 1915 were a little less than half of 1913 receipts. Tobacco goods vary little in the neighborhood of \$740,000 per annum, while Oils in its several grades and kinds are gradually reaching the \$2,000,000 mark. Our Automobile bill amounted to \$971,795 for 864 machines; 163 more than in 1914.

Poultry and game has reached \$50,000, a figure that Eggs passed in 1913, and our needs of this commodity this last year called for 228,600 dozen, valued at \$65,424. Our butter bill from the coast ranges from \$188,800 to \$283,936 per year, to which has to be added quite a sum for supplies from foreign sources. It may interest some readers to know that our annual milk bill to American canners has reached \$344,032, the imports last year being 3,958,566 pounds.

The Customs tables show refined sugar both in the import and export lists. For the last three years there has been more than enough of island refined sugar shipped away than would have supplied local requirements. An average of \$75,000 per year might have been saved from abroad, for the encouragement of local enterprise.

ARRIVALS of shipping for the past year, according to the Customs tables, exclusive of transports and bunker coal vessels, show a total of 456 vessels of 1,605,925 tons having entered at all ports. This is nine ships more than in 1914, though the total tonnage is 54,963 less. Of these arrivals 301 were coast-wise and 155 foreign. The Honolulu entries stand alike for both years at 261, though a little short in tonnage for 1915.

SOCIAL AND CIVIC HAWAII IN THE EARLY FIFTIES.

BY THOMAS G. THRUM.

WHEN the Sage of Ecclesiastes said, "Say not thou, What is the cause that the former days were better than these? for thou dost not inquire wisely concerning this," he surely realized man's natural disposition to magnify the past, and his tendency to underestimate the present by invidious, and hence unjust, comparisons. This disposition is attributed by more than one writer to the mellowing effect of time which retains, in memory's store-house, the pleasant things of life, while its irritations and conflictions, significant though they were deemed at the time, are modified in importance or quite forgotten, in harmony with the theory of the "survival of the fittest."

This then will largely account for the power retrospection holds over many, whether of a political, a commercial, an educational or a personal character, and permits us to study such interesting phases for further profitable enlightenment drawn from social and civic cause and effect; hence comes this contribution in response to requests to round out the reminiscent papers in the ANNUALS of 1914 and 1915 on "Honolulu Sixty-five Years Ago." However, to understand and appreciate the conditions of that period, it is essential to consider the factors conducive to Hawaii's Social and Civic life in the early 'fifties, some of which had long shaped the native element before the arrival of the white people.

Climate being an important factor working on social phenomena, its influence in these islands, in general, has been beneficial, though its reactions in times of peace tended to habits of indolence. The interior of the islands, being elevated areas, is cool, rainy, and abounds in luxuriant vegetation, interspersed with tropical thickets and forests. The windward side, which receives the trade-wind, is more frequently refreshed with rain than the lee side, and hence is uniformly verdant. In fact the climatic conditions were most favorable for the increase, the

physical development, and, owing to the easy production of unfailing crops, for the sustenance of the native population throughout the group. It was through such and like causes that, before the consolidation of the petty kingships under Kamehameha, the scattered rulers and chiefs of other districts and islands were able to raise and sustain for war, comparatively large and well-equipped armies at a nominal cost.

The geographical, or surface conditions, react on social and national development directly, either for promotion or retardation. In Hawaii the surface is well diversified, embodying throughout the group, "extensive plains, high hills, secluded valleys, deep ravines and chasms, towering peaks, majestic mountains and the yawning craters of immense volcanoes."* The islands are well watered for the most part, though possessing but few rivers. While in general this condition promoted social development to a "limited degree, it however retarded political advancement, owing largely to the separation of districts by high mountains and perpendicular gulches, the lack of roads, and the difficulties of inter-island communication by broad and at times tempestuous sea channels.

Food production was favorable at all times and directly acted on the individual and social development and the government, largely shaping the tribal or racial character of the natives. The variety of food products, wild and cultivated, was readily obtained with but little labor and with primitive implements. Fish were abundant and were to be had for the effort of catching them. But the soil, and the fishing rights, was the exclusive property of the king who portioned it out to the chiefs, who in turn portioned it to agents, and they to tenants over whom the supreme power was exercised; and thus was maintained a feudal system which was so oppressive that the common people did not average, probably, more than one-third of the results of their labors, and even in this they were not secure, for there was no dividing line by which a tenant might have and hold anything as his own.

The uncertainty attending such land tenures evolved a most aggravating system. A new king rendered every grade of land-

* Dibble's Hist. of Sandwich Is.

lord liable to dispossession, and the death of a chief revolutionized all the estates under his control. There was no incentive to extensive improvement. Without fixed law, courts of justice or place of appeal, all were really tenants at will, each particular class under his landlord, and a man dispossessed of his lands was liable usually to have his personal property confiscated also.

Taxations were numerous by king, chiefs and priests in both products and labor, yet the government of the ancient chiefs though in a great measure arbitrary had some remedial qualities. There were some customs which even the king could not violate. A chief disregarding them became unpopular and rendered himself liable to be supplanted. The king was under restraint not only by island customs and the fear of other chiefs, but also by the influence of a class of councilors whose business it was to rehearse the proverbs and instructions of their ancestors, with prophecies of judgment in case of disobedience.

The features of the ancient idolatrous system with its many kapus, restrictions or prohibitions, by which high chiefs contrived to envelop their persons with a kind of sacredness, or a sort of superstitious awe and dread seems incredible, since violations of many of the edicts were followed by the death penalty. Their ancient worship contributed further to oppress the people through the connection between the government and their idolatrous institutions. Without enumerating the manner in which the chiefs and priests used their rites to awe and terrify the people by idol worship with all its terrors, and by cruelties and restrictions, still they were made an integral part of the political government. The king was the head of the State as well as the controller of their superstitions; all were his, even the temples, the idols, the priests and the prophets. The natives were still without written language, and ignorance and degradation prevailed.

In social life priestly mandates placed many restrictions upon the people, the more severe falling upon the weaker vessel, woman, and depriving her of various articles of food and even prohibiting the two sexes from eating together, or of having their food cooked in the same oven. This clearly wrought the

subjugation of women and maintained the lordliness of the men in the gradation of their rank. Thus the prestige of king and priest combined to weave a political system of despotic power over a people whose climate, soil and customs had developed a race mentally and physically above the average. Ambitions and jealousies led to conflicts at times by feeding the war spirit of rival chiefs and followers, of whom the more daring, not content with adjoining district contests, sought to subjugate the tribal districts of neighboring islands.

The government was clearly the resultant of the foregoing factors, and, hence, when the whites arrived they found that the beneficent physical and social result of these factors were the chief causes which had raised the natives to a degree above the middle state of savagery, i. e. had developed and prepared them to enter more fully into the government forming state, with its usual social standards shaping and construing the new order.

The first foreign social and national reaction came with the arrival of Captain Cook in 1778, and his successors some eight years later. In this, the opening influence of trade contact, new factors were introduced; wonderment was followed by acquisitiveness; regard for the rights of others took on a new aspect; trading led to the consideration of commercial values; curiosity hungered after knowledge, and not a few of the natives seized the opportunity to venture abroad to other lands. Up to the time of Vancouver's visit, in 1792, little consideration appears to have been had by new comers for the implanting of worthy principles. Contact between natives and foreigners during the introduction of civilization was for the most part from mercenary motives, and fed the baser passions of both races, hence arose the several racial conflicts, and the attempts to cut off vessels which developed during the first twelve years after their discovery, and which factions sought, with the introduced fire arms, to wage wars on rival kings.

Vancouver is credited not only with the refusal to supply them with arms and ammunition, but in his several visits inculcated the spirit of amity and good will between the rival chiefs; he also introduced animals for their future benefit, and led the rulers to conduct their affairs of government so as to

secure the favor of the recognized powers. His was the first recorded voice raised in protest against the idolatrous customs and cruelties which prevailed, and implanted the seeds of a belief in the existence of a God above, which, while of no apparent effect at the time, had a beneficial influence later.

Unfortunately the first foreigners to reside here were runaway sailors of a class whose influence upon the native race was not flattering to civilization, though the better character of the whites was discerned by the natives in their contact with voyagers and traders, to which better impression John Young and Isaac Davis lent aid. This was further emphasized by Vancouver, whose conduct was so marked with kindness and generosity that his memory has been revered ever since. His influence upon Kamehameha was of timely benefit just as the island of Hawaii came under the latter's sole sway, and helped shape his policy as a beneficent ruler when successive victories brought the whole group to acknowledge him as their king.

With the end of strife Kamehameha sagaciously cemented his government by the selection of men of strength and influence as his councilors, and he led in examples of industry and business, profiting by the increasing fleet of traders, even to ventures in ships and shipments to foreign lands. The opening and development of the sandalwood trade induced a commercial greed that Kamehameha and his high chiefs were not slow to profit by, and from their visions of wealth were induced to purchase vessels and goods at extravagant figures, which led to heavy debt to be paid for in sandalwood gathered in the mountains by the people, men and women alike, at the behest of the alii, and, as there were no beasts of burden in those days, were shouldered down by them to convenient shipping points.

Thus trade and shipping wrought with direct and powerful influence upon Kamehameha and his government policy. He courted the favor of those foreigners helpful to his interests, but was watchful of designing persons and powers, and frowned upon lawlessness without coming into open conflict therewith. The latter years of his life were spent quietly with his court at Kailua, Hawaii, in marked contrast to the war spirit which won him his title of Conqueror. Yet to the end he was the

power that maintained the idolatrous system with its severe kapus, which burdened the land and fell of its own oppressiveness during the ceremonies at his death in 1819; it was then that women became free agents for the first time since the days of Wakea, in the traditional history of the race.

Gross indulgencies prevailed as restraints were removed, and the influence of the new king would have been disastrous but for the wise forethought of Kamehameha in naming Queen Kaahumanu as Kuhina-nui, premier, which served as a check on his successor's royal acts. The new order, however, was not established without protest, for a serious revolt at the overthrow of idolatry took place on Hawaii, and a severe battle was fought in which many were killed, including the brave leaders of the old idolatrous faith.

Liholiho (Kamehameha II) lacked his father's staunch character, and was aided in dissolute ways by designing men. In the fourth year of his reign a notion seized him to visit England, partly from curiosity and to secure protection against aggression, and despite the opposition of his chief counselors, he and his favorite queen sailed away, leaving Kaahumanu as regent, and Kauikeaouli confirmed as heir apparent. The royal pair died in London soon after their arrival. Their bodies were brought back to the islands by Lord Byron in the *Blonde*, and during the stay of that worthy commander he encouraged the chiefs in the suppression of vice, the promotion of education, and the adoption of port regulations.

With the waning sandalwood trade, through the denudation of its forests, the whaling industry of the Pacific began its annual recruiting visits to these islands which steadily developed to assume at last a predominating influence.

The second foreign social and national reaction was the arrival of the American missionaries, in 1820, which has been continued to the present by their successors. Permission to land and enter upon their labors was obtained with reluctance, there being a number, even among foreign residents, who opposed the influence of John Young with the king and high chiefs in their behalf. This courageous pioneer band established themselves in several important stations throughout the group, and they

labored diligently to acquire the language and reduce it to writing, to establish schools and churches, and to inculcate by precept and example the religion they professed. As they paved the way and overcame opposition and prejudice by their disinterested labors other missionary bands followed them from time to time to share in educating and evangelizing the race, and to counteract the influence of the "beach-comber" class of foreigners.

Under the paternal system which prevailed among Hawaiians, much attention was given to the high chiefs, because of their influence upon the people; it was thus that schools, and eventually church attendance, were popularized. The printing press, introduced by the Mission in 1822, was a valued aid in the educational work which, paradoxical as it now seems, at that time began with adults. Before the close of 1824 two thousand people had learned to read. Each chief sent the most efficient scholars in his retinue to his different sections to act as teachers, with orders to his tenants to attend.* Following this early effort a school system was adopted by the missionaries in 1831 which established as rapidly as means and instructors would allow, a Mission Seminary at LahainaLuna, a Female Seminary at Wailuku, the Family School for Chiefs in Honolulu, and Boarding Schools for Boys at Hilo and other points, which largely laid the foundation work of the new nation, leading the ruling chiefs to realize their need of political instruction to cope with conditions which the rapidly developing political and social changes, and the growing commercial importance of the islands, was forcing upon them. The first written laws were promulgated in 1823.

Failing to obtain from abroad an instructor in the science of government during the 'thirties, Mr. Wm. Richards was released from Mission work to assume the position of legal advisor to the government, and shortly afterward Dr. G. P. Judd also came to the aid of the chiefs in their effort at forming a constitutional government, which was proclaimed October 8, 1840, following a Declaration of Rights which the king had made the year previous.

* Alexander's Brief Hist. of the Hawaiian People.

The regency continued till Kauikeaouli, in 1833, declared his minority at an end and assumed the sovereignty as Kamehameha III. Up to the time of her death, in 1832, the policy of Kaahumanu was fully maintained, and her strong character directed government affairs through several trying periods that were directly influenced by her adherence, in no half-hearted way, to the new faith of her adoption. This review would be unjust and incomplete without recognition of the strong religious influence exercised among the people by the following noble women of high rank: Notably by Kaahumanu, in her tours of exhortation and destruction of idols; by Kapiolani in defying Pele in her stronghold of Hawaiian superstition and fear; by Keopuolani, Kinai, and others, who aided in a large measure the revival waves of the early 'thirties.

Disturbing elements were the too frequent interferences of foreigners and foreign governments in the otherwise normal development of native affairs. These kept the following social and civic forces in nominal or open conflict to 1850, and which have been felt in recent times to some extent, namely:

The interests of opposing religions were clearly manifest in the arrival and establishment here of the Roman Catholic missionaries, which occasioned a bitter conflict for several years ere religious tolerance could be understood by the native government. Opponents of the administration sought to make political capital out of the perplexities of that eventful period to add to its gravity, by unjustly seeking to place the odium of the persecutions on the American missionaries.

In a similar way and springing from similar causes, when the islands had developed by increasing foreign population and trade, the opposing interests of American and European governments came into conflict, but more largely from officious representatives, and ship's outrages, in well-planned attempts to belittle existant island powers, so that "consular grievances" became for a time a serious menace. National jealousies divided the small community and required the respective governors to act as arbiter. Small wonder that the king and his native councilors sought reliable foreigners to assist them in forming a constitutional government, and in their extremity that they should be

largely influenced by the Mission party. For the first time the constitution now created a legislature consisting of a house of hereditary nobles, and an elective house of representatives, which body jointly appointed four judges, who, with the king and premier, formed the Supreme Court. Shortly following all government property was set apart and a treasury board of four persons created. Oppressive local taxation was abolished, a uniform tax system established, religious tolerance assured, customs' regulations and import duties imposed, and other beneficent acts were passed. In 1841 the first school laws were enacted.

Foreign interests, often unjust and always magnified to harass the government were championed from time to time by the American, the English and the French consuls, and the autonomy of the islands was threatened on more than one occasion. Following the period of petty annoyances and illegal demands by Consul Charlton, Lord George Paulet in the frigate *Carysfort* arrived here to enforce them. Based as they were on injustice the Hawaiian government provisionally ceded the islands to Paulet rather than submit, and appealed to Great Britain, but Admiral Thomas, learning of the cession, arrived and quickly effected their restoration, which took place July 31, 1843. The good offices of Admiral Thomas during his stay were further rendered to the government through wise counsels and by aid in its reëstablishment.

Other difficulties beset the government, about the period just referred to, which produced a critical state of affairs. To avert the threatened designs on the sovereignty of the islands ambassadors were sent abroad and the recognition of independence of the Hawaiian Islands was secured from the United States, England and France. The commissioners on this important mission were Wm. Richards and Haalilio, assisted in London by Sir George Simpson of the Hudson Bay Co., who had shortly before visited the islands and induced this step. Internal difficulties were developing over the land concessions to the firm of Ladd & Co., merchants and planters, in their effort to float their scheme in Europe as the "Belgian Land Contract." Intemperance was already rearing its hydra head and dissolute companions were fast leading the king and several of his chiefs to ruin.

Death had removed several of the staunch aliis, chiefs and chiefesses, and the removal of their restraining influence was taken advantage of by low companions, till, brought to face the natural outcome of his course, the king was led to see what ruin the withdrawal of his friends and supporters threatened him with, unless he made a thorough and complete reform. He therefore with much wisdom publicly arrayed himself on the side of temperance in 1842, and stood firm through all the trying events of the following year; indeed, the Court influence induced a temperance wave which swept over the whole group until the British Commission, during their brief authority, opened again the flood gates of intemperance and licentiousness.*

With the restoration and recognition of the independence of the islands, as already mentioned, came a beneficial change in foreign representatives, with a readjustment of the "ship of state" which made it capable of providing for the regularity of its relations with foreign powers. The king and premier realized that this efficiency was to be secured only through the aid of persons of experience, hence Dr. Judd, who had already proved the nation's bulwark during its former difficulties, became its first secretary of state, even while holding other offices of trust. Shortly afterward R. C. Wyllie succeeded to this position. John Ricord, a new arrival, was appointed attorney-general, and Wm. Richards, minister of public instruction. At the legislature of 1845 the Commission to quiet land titles was established, to devise a system of land distribution made possible through the king's relinquishment of his rights under the old order. This resulted in allotting the landlords one third, the tenants one third, and one third to himself, which portion he again divided, setting apart one half as government lands, and one half as crown lands. Thus a great hindrance to the progress of civilization—uncertainty of rights even as tenants—was removed. Aliens, however, could not obtain fee simple title until 1850.

The judiciary system had lacked efficiency during the formative state of the government, with a governor sitting as the presiding judge, whereof there was no occasion lost to take advan-

* *The Friend*, July, 1843.

tage by unfriendly persons whenever the opportunity presented itself. This was all changed however with the opportune arrival of Wm. L. Lee in 1846, en route to Oregon, who fortunately was induced to remain here and take the position of chief justice, whereby confidence and respect was established with the natives and foreigners alike.

Treaties with foreign powers, ostensibly for mutual benefit, were often the source of disputed interpretations, and always to Hawaii's injury, especially with the French. The course of Consul Dillon and his successor Perrin kept the foreign office busy for many months, through interference with the internal affairs of the kingdom, and the arrival of a French war vessel was the occasion of reiterated demands, or to suffer under the guns of a great nation. This had occurred in 1842 and 1849, and was again threatened in 1851, when, after a long and fruitless discussion, the king in privy council signed a proclamation placing the islands, provisionally, under the protection of the United States until relations with France should be placed upon a footing compatible with the king's rights as an independent sovereign; or, if found impracticable, then the protectorate to become perpetual. When this became known the difficulties were quickly reduced to two points, and nothing more was ever heard of the others.

Commercial enterprise had struggled spasmodically for a foothold since the decline of the sandalwood trade. Cane and coffee culture had begun feebly in 1825, but it was many years before these products figured as exports. Silk, and also cotton were tried but without success. In the meantime the steady development of the Pacific whaling industry found these islands an agreeable, convenient, and inexpensive recruiting point, and the annual arrival of the fleet for repairs, transhipment of oil and bone, reshipment of crews, and obtaining supplies, gave our ports unwonted activity during the fall and spring shipping seasons. Furthermore, the Hawaiians were proving good whalemen and excellent sailors.

A serious interruption to commercial development occurred by the failure of Ladd & Co. and the collapse of their Belgian colonization scheme was followed by the exodus of many from

the islands by the excitement attending the California gold discovery and its allurements. The islands profited for a brief period by supplying island-grown products, from which the potato growers of Maui and Hawaii largely benefitted. With the return of the disappointed gold seekers further efforts were made in agricultural lines, such as wheat and sugar, which resulted in the formation of an Agricultural Society "for the promotion and improvement of agricultural operations and products in these islands." The proper development of these schemes called for capital and labor, which the islands lacked, and hence the introduction of Chinese became necessary in 1851; thus came about the systematic establishment of the sugar industry, for which Hawaii is famed today. The Society encouraged agricultural industry materially, and introduced many valuable plants and animals, the benefits of which we now enjoy.

The year 1850 and following was a notable period of activity in social and civic affairs. A census of 1850 showed a total population of 84,165, of which but 1962 were foreigners. In 1853, during the small-pox scourge, the total was reduced to 73,138, the foreigners numbering 2119, of which 692 were Americans, 435 British, 309 island born foreigners, 86 Germans, 60 French, and 364 Chinese. Imports and exports both made gratifying gains in 1850, and general commercial improvement was manifest. Shipping was increasing, building changes were in progress, new enterprises were inaugurated and a new constitution in 1852 took the place of that of 1840, so liberal in its terms, that, with his land gifts to the people, formed the glory of the reign of Kamehameha III.

The political agitation that came to a crisis at this time was wholly foreign as to cause. The staid easy-going native character was being influenced by the activities of commercialism, and the new comers were agitating for more vigorous policies in government administration. Effort toward reciprocity with the United States was sought but failed; intrigue was seeking to undermine the controlling power over the king and his council; an annexation scheme was in progress, which, though strongly opposed by the leading chiefs, was favored by the king as a refuge from impending dangers. The rumored formation of a

filibustering expedition on the Coast, to seize the islands, suddenly ended however, all negotiations, and the king fell back upon his treaty rights for protection. The political situation was tense, an anti-missionary party, claiming to represent business interests, sought for more consideration in the administrative policy and, with a strong petition and much public demonstration besought the king to remove Dr. Judd, the minister of finance, and Rev. R. Armstrong, minister of public instruction, from his cabinet, the petition alleging that they had been largely responsible for the introduction of the small-pox which was then raging. Counter petitions followed, assuring the king of the public confidence in these tried servants of the nation. Nevertheless, by way of compromise Hon. E. H. Allen, late U. S. Consul, was appointed to succeed Dr. Judd in the cabinet. The opposition had effected a change, in a sense, but found the government quite as conservative as ever.

The indulgences of the king at this period, termed by a writer "relapses into the excesses of his youth", did not modify the difficulties of the new administration. His course of life doubtless hastened his end which occurred on December 15, 1854, after but a week's illness. He was deeply mourned "for his unselfish patriotism in the liberal constitution granted, and the gift of the right to hold land in fee simple." Liholiho, his adopted son and heir, succeeded him on the throne as Kamehameha IV. who in his inaugural address on his accession evidenced the high hope and purpose which he held for a prosperous administration. His reign promised much for Hawaii, who, though but twenty-one years of age, was of bright, studious nature and graceful manners.

Although but brief reference has thus far been made to the apparent civic factors involved, yet the intelligent reader will not fail to extend the argument to those complex and oftentimes intricate forces which, in conjunction with these, have acted through an extended and mostly a favorable past; and thus it will be found that the causes which have directly acted on the native Hawaiians and their nascent government, have been from the first both simple and compound. Such natural and social causes, whether patent or obscure, developed early affairs with

comparative rapidity, and ere long shaped finally the political, industrial, and commercial institutions of the 'fifties, whose influences have persisted until they have become our inheritance and the foundation of further advancement. Happily for us however, we have not fallen heir to the prolonged period of critical and stormy political and international events which preceded the quieter developments of later years; but whenever the occasion arises we will find upon making the trial that necessity compels us to justify our present social and industrial conditions by an appeal to the whole-hearted, self-sacrificing labors of a score or more of the sturdy patriots of the 'fifties; these were the men who in those trying times stood sponsor for their own and the people's liberties, as well as for the social and civic developments which we, as their successors, are now consummating for the material advantage of Hawaii and the Hawaiians.

SANDALWOOD DAYS

BY J. M. LYDGATE.

SANDALWOOD is an extremely ancient article of commerce. The ancient Vedas mention it, running back to the 5th century, B. C. Among the glories and extravagances of King Solomon, special mention is made in the Bible of "the great plenty of Almug trees" that Hiram brought back together with the gold of Ophir, and precious stones. And the almug trees apparently outranked the gold and jewels, for "the King made of the almug trees pillars for the house of the Lord, and for the King's house, harps also and psalteries for singers; there came no such almug trees, nor were seen unto this day." These Almug trees were Sandalwood.

The Sandalwood, of varied species, is found throughout India, parts of Africa and the islands of the Pacific. It has been highly prized and in great demand through all the ages, its use for incense purposes being imbedded deep in the ritual of Buddhism; and the demand for it still persists in Oriental lands where it is an indispensable means of religion.

Because of its grateful fragrance it is much used for the manufacture of fans, small boxes, and other bric-a-brac. It is also supposed to have rare virtues as an unguent or balm; so that no smallest bit of the wood need be wasted. It is now cultivated to a limited extent in parts of India, the trees reaching maturity in twenty-five years, when they are cut down, the wood subjected to a course of treatment to bring out its virtues, and then shipped away to China, mostly, which remains, as ever the largest market.

The value of sandalwood in the Chinese market varies from \$50 to \$200 a ton, since it is sold by weight and not by cubic contents, like other wood.

The Hawaiian species, four or five in number, run through many forms, both in character and habitat, from a stunted bush to a good-sized tree; from the arid sea-shore to the cloud-capped mountains. Though even now not an uncommon tree it must at one time have been abundant, as the large export indicates.

It enjoys the peculiar distinction of being hemi-parasitic, that is, it will not grow on its own root system, but depends on the roots of other plants for subsistence, from which it sucks nutriment through haustoria, or suction organs. For this reason all efforts to raise trees, or even start the seeds, by the ordinary methods, on these islands have failed. In a state of nature, however, the conditions are evidently satisfactory, as young plants may often be found apparently quite thrifty, in the mountains.

Sandalwood was first recognized in connection with the islands, at least as a commercial product, in 1791 by Capt. Kendrick of the *Lady Washington*." Apparently as an afterthought, when he had reached Niihau, he left behind three men, Rowbottom, Williams and Coleman, with instructions to return to Kauai and there collect a cargo of the wood against his return, a year or two later. As wages for this service they were to receive \$8.00 a month each. Vancouver found them on Kauai a few months later in a state of pitiable destitution, dependent on the natives. From this time on, it became increasingly the one source of wealth of the islands until it was finally exhausted. The nearer and more accessible sources of supply were, of course,

denuded first and very rapidly, so that each succeeding shipload was more difficult to obtain.

Of course there were no roads in those primitive days, especially into the mountains, and the transportation problems were more difficult than now because the mountains were not nearly so open as now. Not only were the sources of supply far away and inaccessible, in the mountains directly, but they were much farther away indirectly, as it were. The wood was shipped almost entirely from the few recognized harbors on the lee side of the islands. For example, apparently, all the sandalwood on Kauai was shipped from Waimea. From the mountains back of Waimea, probably, most of it came; even so, a distance of fifteen to twenty miles. But also much of it must have come from about Koloa, Lihue, Wailua, or the region of Moloaa, twenty, thirty, forty, fifty miles away. And on the larger islands the distances were greater still.

There was, of course, no such thing in those days as transportation by wheeled vehicle, or beasts of burden. Men and women were the beasts of burden, feudal retainers of the chiefs, impressed for this laborious service, which was levied on them, as a sort of personal tax.

The loads of wood were carried on the back by means of *haawe* packing gear, corresponding to the tump gear of the north west Indian, the pack rope passing over the shoulders, and under the arms, after the manner of the knapsack gear, the most practical of all ways of carrying a load if you must carry one, and those who were used to this method could carry very heavy loads, for very long distances, 135 pounds being considered the limit of load. The constant pressure of this carrying gear wore calloused places on the shoulders, which these men carried to their dying day, and which received the special name "leho" callous, and they were called "kua-leho," or "callous backs."

Ellis records, in his "Tour of Hawaii," that when he came to the district of Kohala substantially the whole able-bodied population of this and adjoining districts, were absent, in the mountains, in quest of sandalwood, and when, a little later, he came to Kawaihae he saw the surprising spectacle of detachments of men, in droves, and companies, straggling down along the trails.

to the aggregate number of upwards of 3,000, with their loads of sandalwood borne in that way. Here it was received by the king's agents and stacked up for shipment.

Primitive peoples, even when not improvident, live very close to the soil, a sort of hand-to-mouth existence. Where there is no need to make provision against winter, where the taro patch is always available, with a continued succession of crops, with no long intermission of an off season the ordinary Hawaiian becomes childishly trustful, not to say negligent.

Production on a large scale, for commercial purposes, was unknown in those times. Each head of a family was a small farmer, raising just enough for the immediate needs of himself, and those dependent on him. Why should he raise more, since he couldn't sell it, and all he really owned was what he used? So his daily program was nicely adjusted, through generations of experience, to meet just these conditions.

Now, when there was a sudden new departure, and his regular routine of life was upset by the command of the king, that he should go into the mountains and spend weeks or even months at a time, gathering sandalwood, his farming suffered through sheer neglect. The fields that were not planted didn't grow, and soon there was a serious falling off in food, that grew to the proportions of a famine, and even though the more industrious may have found time to till their own patches, the konohiki patches of the chiefs must be neglected, since this was konohiki time that they were spending on sandalwood, and konohiki mouths, the chiefs and their retainers and agents, must be fed at any cost. Furthermore, the conditions of life during these periods of mountain service were so debilitating that many were more or less "used up," and were anxious, on their return, to rest, rather than "buckle into" neglected fields.

This unhappy condition was farther aggravated, on some of the islands at least, by the blighting aftermath of war. The long, and sanguinary, conquest of the islands by Kamehameha left them, more or less, desolate and disorganized. The chiefs were chiefs no longer; the common people were at sea; the wheels of life ran brokenly, the crops were ruined, want and suffering followed. Vancouver reports that at Lahaina they

could only offer four lean pigs. From this condition of things they were slowly recovering when the sandalwood disaster fell upon them.

But to resume: From the storehouses on the beach the wood was lightered off to the vessels by great fleets of canoes. Corney relates how 500 canoes were used for that purpose in loading the *Columbia* at Waimea, Kauai, while at one of the Oahu ports 200 canoes were used working day and night for the same purpose.

Sandalwood was a veritable bonanza to these early Hawaiian kings, albeit one of very doubtful ultimate benefit. The prices they received, running up to \$145 or \$150 a ton, considering how little it cost to produce it, were simply extravagant. The total expense was one of collecting and shipping. Even if this had been paid for at any reasonable rate, the profits would have been enormous. In later times pulu was collected and shipped in very much the same way from the same regions and under the same conditions of difficulty at \$60 a ton. At the present time awa is being collected from the same regions though much more thinly scattered for about \$100 a ton. And in both these cases there is a large shrinkage in weight, which of course very much increases the cost per ton. Imagine the bonanza that sugar would be if the price ran to $7\frac{1}{2}$ c. and we didn't have to raise the cane, only harvest and manufacture it. But in the case of sandalwood there were no expenses, absolutely. Nature produced it, the common people collected and delivered it and the king stood by to receive the money. It was clear profit, with no risk, no uncertainty, no competition.

Perhaps it is not to be wondered at that this easy money went to their heads; that it seemed to them an untold wealth with boundless limitations. With only the vaguest kind of knowledge of the supply in the mountains, for they had been looking for koa and kauwila, not sandalwood, no one was in any position to make an intelligent forecast as to how long it would last. With characteristic Hawaiian improvidence, no one probably thought to ask the question. That it could not last forever never occurred to them. That it was money easily come by meant of course that it would also easily go. The reckless way

in which they bought expensive and useless stuff was childish. Whatever they saw, they wanted. Whatever they wanted, they bought, so long as the sandalwood held out; and the prices made little or no difference. We hear of large invoices of silks, satins, crepes, broadcloth, etc., not in the way of business, as merchandise, but as luxury; of Kaumualii, with princely nonchalance on one occasion making a casual present of a thousand dollars in sandalwood and on another ordering a diamond "about the size of a coconut." After the manner of other, and more enlightened princes, they wasted money on ships and munitions of war. We read of one vessel after another being purchased by the king. The *Albatross*, the *Forester*, the *Bordeaux Packet*, the *Columbia*, the *Niu*, the *Becket*, the *Thaddeus*, the *Cleopatra's Barge*, etc.

We think of them as goodly vessels of some size, several hundred tons at least. As a matter of fact, they were mostly scrub schooners, or brigs, more or less ready for the boneyard, 100, 120, 150 tons burden, the best of them less than 200 tons, falling far short of the size and dignity of the *James Makee*. But the prices they brought were phenomenal, \$40,000, \$50,000, \$60,000, reaching the climax of extravagance in the *Cleopatra's Barge*, 191 tons, for \$90,000. These prices bore no relation to the actual value of these vessels, which were really worth perhaps from a tenth to a quarter of what was asked for them.

The inexperienced Hawaiian was imposed on by his mercenary European brother, but he was imposed on the more easily, and the more flagrantly because he was so "flush" of money, and so keen to spend it. He was like a woman at a bargain counter, he bought extravagantly, things that he didn't want, just for the pleasure of buying! And this pleasure, and the follies to which it led, were possible because of the wealth of sandalwood.

Speedily, or as speedily as possible, they killed the goose that laid the golden egg; and apparently without misgivings or compunctions—nay, doubtless with joy, on behalf of the common people. By the time the missionaries arrived in 1820 it was already pretty well depleted, and by 1825 we hear little more about it, the stock was practically used up. Apparently

no serious effort was made to guard against extinction. Kamehameha's traditional injunction that the young trees should be spared for his children, seems to have been by way of philosophic suggestion, rather than serious command. "The young trees are useless. Why cut them down?" Outside of Kamehameha no one cared and he didn't care very much.

Could the supply have been protected and the business fostered into a steady means of income? Theoretically yes. Practically, no. Theoretically the trees had grown in the past, why should they not continue to grow in the future, if they were only spared and protected? But practically the changing conditions must have been fatal. Cattle, goats, imported blights and pests, as well as the woodman's axe, and fires, have decimated our forests, and have been particularly disastrous to those foothill regions to which the sandalwood naturally belongs. That, in nearly a hundred years of unmolested peace, as far as commerce is concerned, it has shown so little signs of recovery, would seem to indicate that the conditions are hopelessly adverse to an automatic natural recovery.

Manifestly Hawaii is the home of sandalwood. What nature has once produced so willingly, may she not be persuaded to produce again, with a little intelligent help? So long as the demand and the price hold, it would seem as though there might be a chance for profit in cultivated sandalwood.

[A sketch of "The Sandalwood Trade of Early Hawaii," as told by the pioneer traders, voyagers and others, compiled by Thos. G. Thrub, was published in the ANNUAL for 1905.—Ed.]

A RECORD climb to the top of Mauna Loa, Hawaii, by Messrs. J. W. Waldron, A. L. Castle, and Lts. Sadler and Robertson was made in July last, from the Kapapala Ranch, the party starting at 4:30 a. m. and reaching the summit crater at 3 p. m., with one stoppage en route and delay for a guide. After an observation of some two hours of Mokuaweoweo's changes since its outbreak of December, 1914, they returned, and reached the ranch house after dark. Steps are in progress for the laying out of a built trail to the summit, and the erection of rest-houses on the route, if funds are secured. Maui has already done this service for the comfort of Haleakala sightseers.

HAWAIIAN PAGEANTS OF 1915

AS intimated in the account of Hawaii's pageantry effort given in the last issue of the ANNUAL, a desire has been awakened for a better knowledge and increased regard for the ancient national customs and characteristics of the Hawaiian race, which bids fair to become a popular annual event. Its educational benefit was exemplified this year in the "Peace Pageant" feature of Carnival week, under the auspices of *The Friend*, illustrative of "One Hundred Years of Peace", written by James A. Wilder of this city, commemorative of the century of harmony between Great Britain and the United States.

The scene of this pageant was at the Alexander Field and adjacent hill of the Punahou grounds, and was very successfully portrayed by some 1500 people, very largely the pupils of Punahou academy, Kamehameha, Mid-Pacific, McKinley, Normal, and other schools, and representing various nationalities by costumes and banners. A memorable spectacular scene was the replica of the Peace monument, "The Christ of the Andes", upon Rocky Hill, as, at the opening scene one thousand people suddenly came into view and massed about the hill at a bugle call in "Salutation to the Prince of Peace" by the rendition of Kipling's "Recessional". This was followed by the "procession of nations", and "enactment of the drama of war vs. peace".

This pageant was Hawaii's contribution in response to the proclamation by the American Peace Centenary Committee to mark with suitable exercises the anniversary of the ratification and proclamation of the Treaty of Ghent, and was witnessed by a large and appreciative concourse of people.

The Hawaiian pageant of the Carnival season, entitled "The Conquest of Kamehameha and Dawn of the New Era", fortunately had for its setting Punahou campus, for it was an elaborate, bold subject, that embraced all the islands of the group, and these extensive grounds, with their varied tropical foliage, seemed specially appropriate for the geographical scheme of the various islands, with ample space on all sides for the throng of spectators. This took place on Monday, February 22nd, and was enacted throughout by Hawaiians only, principally pupils

of the Kamehameha schools, in excellent spirit, and in the following summarized order:

The pageant opened with a procession of tillers of the soil bringing products to their respective islands; chiefs, warriors and chiefesses; royal herald with high priests and attendants; attendants of kings and queens; torch bearers; King Kiwalao and priests, with kahili bearers; ascension of king and high priest to platform for performance of various temple ceremonies. This was followed by scenes indicative of a royal progress of the kings of the different islands, leading to a concourse at Oahu of Kamehameha and chiefs when Kaumualii acknowledges the conqueror and cedes Kauai, thus bringing the whole group under his sway.

Part two illustrated the historic event of breaking the kapu and the resultant battle of Kuamoo. Then came the grand pageant representing the new era in its tour around the campus. The procession, headed by the grand marshal, comprised royal school attendants, kings, queens, princes and princesses, high chiefs and chiefesses and those of lower degree, and their descendants, with their respective attendants bearing kahilis and other emblems indicative of their rank. Interspersed in the first part of the ceremonies were groups of hula dancers portraying ancient entertainment at the various courts.

The pageant feature of Kamehameha day, June 11th, by the Hawaiian Societies, which took place again at the Public Baths grounds, Waikiki, portrayed historic incidents in the ceremonies attending Kaleiopuu's proclamation of his heirs and successors to the kingdom of Hawaii, which was presented in four scenes.

Two halau of coco palms, as royal pavilions, were erected a little distance apart centrally in the grounds, one being that of Queen Kalola and her attendants, simply illustrative of the ancient feminine court, while the other represented that of the king, wherein the several historic events took place and was therefore the scene of action throughout, somewhat as follows:

The pageant opened with the arrival of Queen Kalola, consort of King Kaleiopuu, with high chiefesses and attendants, with kahilis, who group themselves in graceful order, enter-

tained meanwhile with music and the hula. Their grouping complete, the procession for the occupancy of the king's pavilion arrive in stately array and group themselves, supposedly, after the customs and pomp of Hawaii's court of ancient time, presenting the following scene:

King Kaleiopuu's court approaches the halau; two heralds announce the coming of the war god Kaili; high priests and the ilamuku (marshal) with wand of office precede the king, with kahili bearers on either side. Next come the two princes, Kiwalao and Kamehameha, with a corps of chiefs in attendance bearing small kahilis; high chiefs representing the six districts of Hawaii follow with attendants bearing products. As these arrive they group themselves or take respective place according to rank, or station, the district high chiefs behind their superiors. All being in readiness the king makes his proclamation of successorship. Two sets of rival dancers have meanwhile entertained the court with various hula performances.

Scenes three and four were the historic incidents of Kiwalao's court, where the insult to Kamehameha in the awa ceremony occurred, by King Kiwalao passing the cup to an attendant chief, instead of himself drinking what he had received at the hand of Kamehameha. This was enacted with dramatic effect, the insult being immediately resented by Kekuhaupio on behalf of Kamehameha, in his striking the cup from the hands of the chief ere it had touched his lips, and at the same time publicly reprimanding the king for his fault. Kekuhaupio and Kamehameha then withdraw, and the pageant with its semblance of ancient court ceremonials closes at this point, though history tells us that its aftermath was the war between the two parties which resulted in the death of Kiwalao, and Kamehameha becoming thereby sovereign of the whole island.

A RECENT estimate of Honolulu's population placed it at 67,010, while that for the whole Territory, exclusive of the federal army and navy forces, is given at 215,675; Oahu being credited with 95,164. While not official they are interesting as an approximation.

CARNIVAL SEASON, 1915

HONOLULU'S carnival season was to have opened Saturday, February 20th, with a well-planned Peace pageant, at 10 a. m., but on account of rainy weather the event was changed to a later date. The city was gay with its decorations, the number of prominent buildings and principal business streets being bright with patriotic colors. The aquatic events proved exciting with the establishing of new records, and the Japanese lantern parade, joined in by other nationalities, was a blaze of glory in its long line of march, while the number of prominent buildings that were illuminated exceeded all prior effort.

The 22nd itself was marked by the grand military parade and review of imposing numbers, indicative of the strength and efficiency of the federal forces stationed here. This was followed in the afternoon by the Hawaiian historic pageant at the Punahou campus, the account of which is given elsewhere in this issue. As if to make the day more memorable was the arrival of the fine new steamer *Great Northern*, from Los Angeles, with a crowd of excursionists, after a splendid run of four days, ten hours, forty-three minutes; a new record. A brilliant display of fireworks closed the day's festivities.

An amateur performance of Sho-Gun, on the terrace of Bishop Hall, was termed the crowning event of the carnival, and would have been repeated later in response to popular demand had time allowed. Then there was a decided children's day, when some 1600 school tots of all nationalities held their fete of marches, songs and dances at the executive grounds. Nor must the series of military exercises and sports that entertained the public at Kapiolani park be overlooked. On the evening of the 25th was the massed band concert in front of the executive building, in which six military bands participated, following which was the mimic eruption of Punchbowl, which was made very realistic in its pyrotechnic display.

The fourth annual Hibiscus exhibit, deferred for a feature of the Carnival season, opened on the 26th, and the aims and expectations of its promoters were fully realized by the enthu-

siasm of the throng of visitors at the "marvels of perfection" and varieties that have been developed under the careful culture as was here shown. The National Guard's Armory was the scene of this floral display for competitive prizes, and no light task befell the judges to award their twenty-five prizes among the many creditable entries.

The evening of that day was given over to the water carnival in the harbor, where all kinds of craft were gaily illumined and moved in stately procession to the music of several bands, after which the fireworks display across the water carried till a late hour.

After an eventful week was presented the Peace pageant, in celebration of the Ghent centenary (mention of which is given elsewhere) and closing with a remarkable exhibit of military manoeuvres by the federal troops at Kapiolani park, which were witnessed by a vast throng of spectators, as in fact were all the events scheduled. The floral parade of former years had no part in this year's program, that feature of Honolulu's observance of Washington's birthday being changed to a season of carnival revelry, during which the public had the opportunity of being surfeited again with baseball, for the sporting fraternity served it up seven days in the week, possibly as a tourist attraction!

The various pay events of the carnival season fell short of meeting all its expenses by nearly \$6,000, prices of admission having in many cases been a reduction on last year rates, yet as a promotion and advertising scheme it was deemed a great success.

THE Kauai Historical Society completed its first year of existence in August, 1915. It has been a year of much interest and activity in recalling and recording the early history of the Island. Much valuable material, largely reminiscent, has been collected concerning Lihue, Koloa and Wailua mainly, and much more is in hand from other sections, so that it is hoped that ultimately the whole Island will be covered and no important available information be overlooked. It is to be regretted that the other Islands, especially Hawaii and Maui, have not organized similar societies.

KAWAIAHAO SEMINARY'S SEMI-CENTENNIAL.

TOO late for mention in last issue, but of recognized importance for this belated record, for future reference, was the observance of the Fiftieth Anniversary of the birth of Kawaiahao Seminary, which took place November 28th, 1914. This joyous event occurred on the premises of the institution, Manoa valley, and was made memorable by the large gathering of patrons, friends, officers, alumnae and pupils of the institution in the interesting exercises, historic reminiscences, and outlines for future enlargement. In illustration and commemoration of this was given a pageant by the pupils portraying the development of the "Spirit of Kawaiahao" in the fifty years of its existence in the endeavor to carry out the school motto: "Not to be ministered unto, but to minister." This was told in song, and dance, and tableaux, various groups showing by costume and pastime the different nationalities to whom its benefits now extend, all of which was very creditably presented.

The literary exercises embraced Rev. O. H. Gulick's paper on the various girl's school efforts to Mrs. L. H. Gulick's family school of eight girls, daughters of Hawaiian missionaries, which was the humble origin of the Kawaiahao Seminary; Mrs. Lydia Bingham Coan, as its first principal, gave her experiences toward meeting the ever-changing conditions; Mrs. H. Imhoff, and Mrs. M. Waldron, for the alumnae, gave the girls' story, and Mr. Wm. R. Castle, of the trustees, presented the history of the institution in a reminiscent vein full of deep interest. Miss M. E. Bosher, the present principal, favored the gathering with her "Dream of the Future", indicative of deep plans and high aims for the coming years. This was followed by the late Dr. Ferguson in an address on "Our Assets", embodying the needs of an additional endowment of \$50,000, toward which nearly one-third of the amount came in sight before the "feast of reason and flow of soul" ended the day's celebration.

MILL'S INSTITUTE, Kawaiahao's brother institution, has found a worthy successor to the late Dr. W. P. Ferguson, as principal, in Dr. Robert Day Williams, from Claremont, Cal.

CHARLES REED BISHOP

1822-1915.

BY WM. T. BRIGHAM, A.M., SC.D.,

Director Bernice Pauahi Bishop Museum.

IN the midst of carnage that shocks the world that we in our easy ignorance thought civilized, it may be a relief to turn for a few minutes to a life full of peace and good works. Where the militarist leaves smoking ruins of homes and cathedrals, slaughtered or cruelly mangled husbands and brothers, sinks peaceful ships drowning hundreds of innocent women and children, and perpetrating every evil abomination that the old-time theologists attributed to the devil, the Man of Peace leaves institutions founded and endowed for promoting Education, Science, Charity and Good Morals,—his memory blessed by generations that he never knew.

Glen's Falls was a picturesque village on the Hudson river, sixty miles north of Albany and eight miles south of Lake George, sixty years ago, as I well remember it, and it probably had not much changed in the generation since Charles Reed Bishop was born there. Deprived of his parents in early youth he yet had a good environment to develop the quiet dignity and steadfast rectitude of the man we knew. Great would be the interest if we had all the details of the life of that boy, thrown on his own resources at an age when most of us need the watchful care of parents. I never heard Mr. Bishop mention any particular guide or mentor who took the place of parents in his early years. His faithfulness to the work in hand, whatever it might be, seems to have been innate, and in no way corrupted by unfit companions. This is not intended as a biography of Mr. Bishop but rather as a reminder of the good that he did in a long life on the Hawaiian Islands, for it was not long before the natural desire came to him to know more than the rural region of his birth offered, and the good sense of proper companionship that had befriended in early life continued when he left his native shores to seek a fortune in what was then called the "North-west"; West hardly went beyond the village of Chicago in those

days. In the little village of Sandy Hill, near his birthplace, and where he worked in his apprenticeship, Bishop met a young man a year his senior with whom he started on his long journey. William L. Lee, afterward first Chief Justice of the Hawaiian Kingdom and founder of its system of law.*

The hand of God seems visible in the direction of that voyage, for provisions gave out and the ship put in to Honolulu for supplies. Perhaps with exception of the missionaries no ship ever brought greater help to these islands than these two young men were, all unconsciously, bringing in their unexpected visit in search of food. The beautiful surroundings pleased them as they have pleased so many others since, and they decided to leave the ship and try their fortune in a group hardly a generation removed from heatheness.

The brig *Henry* with the two adventurers on board left Newburyport February 23, 1846, and after a stormy and slow passage of eighty-four days reached the port of St. Catherine, Brazil, where they got their first glimpse of tropical vegetation; but the worst part of the voyage was to come,—the passage of Cape Horn in midwinter, and it was the twelfth of October before the storm-tossed, leaking brig dropped anchor in Honolulu harbor; there was no wharf then nor for many years after.

John Ricord was attorney-general and sorely in need of an assistant, while the local Bar was as shaky then as it has been several times since, so a welcome was ready for the young bearer of the diploma of the Harvard Law School, apart from the well-known hospitable greeting extended to almost all newcomers in those days. It was not long before Lee was made a judge, and not long after Chief Justice, as urged by Dr. Judd, then a most important member of government, so that for the first time the Hawaiian judiciary was organized and had a head. The appointment as president of the very important Land Commission gave him full occupation, while his companion after a short time in the Interior office became secretary of the United States consulate, an important and lucrative position in the whaling days. In 1849 the California gold fever extended to

* William L. Lee was born at Sandy Hill, N. Y., February 25, 1821; landed in Honolulu, October 12, 1846, where he died May 29, 1857.

the islands and Bishop was very anxious to go to the new Eldorado, but his affection for Lee kept him here and perhaps another affection had its influence as well. While his interest in education so valuable to the country in later days took him often to the Royal School for Chiefs, then in the charge of Mr. and Mrs. Cooke, wise selection of companions picked out the Princess Pauahi, who soon showed an equal inclination to the interesting young haole. And just here Bishop met his first opposition, for Paki, the obdurate father, had hoped to marry his daughter to one of the princes, Alexander and Lot, sons of Kekuanaoa and Kinau and adopted sons of Kamehameha III. As Alexander was in love with Emma Kaleleonalani, adopted daughter of Dr. T. C. B. Rooke, Lot was the only free one. In vain Pauahi protested that she would rather die than marry him, the father insisted and the poor girl was at last relieved by the manly letter of Lot (which I have read) in which he declares that his love for his schoolmate was so great that he would do nothing to displease, and so refused to marry her. That obstacle removed, the lovers were privately married in the school parlor, and Abner Paki in his wrath disowned his beloved Bernice and took Liliuokalani in her place; but the father-love was stronger than his anger, and after a year's estrangement all was forgiven and the young couple came back to Paki's home, "Haleakala", which soon became the greatest centre of hospitality in Honolulu. In this quiet way began the united life that was to give so much to Honolulu and the whole kingdom, not merely in money, but in far greater measure in good influences among both natives of the soil and the foreigners who settled here and those who merely pass through on their way to other lands.

And now came other changes: the secretariate was given up and Bishop became Collector of Customs for the port of Honolulu. Other business interests intervened and in partnership with Wm. A. Aldrich he was for five years engaged in mercantile pursuits, and prior thereto is said to have shipped much sugar to the Coast; the Chinese were the first sugar-makers of importance, and their stone roll mills, or vertical wooden ones turned by cattle existed within the memory of the

writer. Besides sugar other agricultural products were in great demand in California and potatoes were a very important export, lasting into the sixties. Then the whaling industry was in its prime and many whaleships came to Honolulu and Lahaina during the winter months, making such commercial activity in the little kingdom that need was felt of a bank with its deposits, loans and exchanges. Messrs. Bishop and Aldrich had the entire confidence of both natives and foreigners, and fitted naturally in the place that was waiting for them. In a most modest way the bank began in a small room and the partners were owners, directors, tellers, cashier and all the other officers combined. They had no bank commissioners to watch them, nor did they need watching; but their work must have been considerable in counting the deposits of every coin issued by Mexico, the states of South America and often of the East Indies. Silver coins worn so smooth that it required expert skill to make out their denominations, or origin, passed freely in daily commerce.

Later Mr. Aldrich went into partnership with J. S. Walker and had a large commission and shipping business on the waterfront. Bishop & Company, Bankers, continued with more business and more assistants.

It was in this part of Charles Reed Bishop's life that the writer of this notice came first to know him, the beginning of an acquaintance that lasted through a long life, the last link being a letter from him received perhaps a week before the news of his death. If the writer's personality becomes too obtrusive the excuse must be his desire to bring the life of the Bishop family he knew before the reader in a clearer light. Mr. Bishop's business activities have been laid before the public in many forms, but little has been said of the home life of this interesting family. Is it not more important in painting a man's character than his conduct of public turmoil and business?

Early in the spring of 1864 the bark *Smyrniote*, three weeks from San Francisco, anchored in the harbor of Honolulu, and my companion Horace Mann and I went ashore with the captain and called at the office of Aldrich & Walker, the agents for the packet line. Mr. Aldrich introduced me at once to Mr. Bishop whose bank was near by and to whom I had a letter

of credit, and then took me to the office of my cousin, James W. Austin, in the upper story of Honolulu Hale over the post-office in Henry M. Whitney's store. Before noon I was welcomed and lodged and had made several new acquaintances so that the surroundings no longer looked so strange. A day or two after, Mr. Bishop took us on a horseback ride around Diamond Head (there was no road for wheeled vehicles). After that came a dinner at Mr. Bishop's; my partner was Miss Ellen Armstrong (later Mrs. Weaver), with whom commenced a friendship which has lasted more than fifty years, and we two alone survive of that large and agreeable party. Mrs. Bishop explained the many new and native dishes as I sat by her side, while the little kahilis waved over our heads, but this proved the first of many delightful entertainments in Haleakala, at the Waikiki house, and on picnics, from the Bishop hospitality. We soon had our own little house on Alakea street, where we could carry on our study of our explorations without interruption, but we had to give up many of our evenings to the social life of the very pleasant town. We had a Reading Club, and we did not hesitate to dive into Shakespeare, Schiller, Milton, each taking part, and the Bishop parlor was the most frequent place of meeting. More than once, dropping in for a call after dinner, Mrs. Bishop suggested charades, and while we youngsters went up stairs to dress and make up our parts, the many retainers of the Bishop family were sent over the little town to ask friends to an informal entertainment and by the time the players were ready the parlors were full of friends, and any shortcomings of the acting were overlooked by the amused company; then came the cakes, jellies and lemonade (there was no ice in the town then), and by ten o'clock all were scattered to their homes and the streets were dark unless the moon lighted them. When the moon was full we had our horseback rides, or the king's boat and often the governor's also were put at our disposal and with Mrs. Bishop, Liliuokalani and other Alii, with songs accompanied by guitars, we were rowed about the harbor (the *ukulele*, well named "Jumping Flea," had not then been introduced). In all these amusements Mr. Bishop seemed pleased. Except when exploring on other islands hardly

a week passed without some intercourse with the Bishop family.

It was natural that such a man as Mr. Bishop should be called to the ministry of the native kings, and Kamehameha IV offered him a portfolio which was declined, not because he was not interested in public affairs (all his subsequent life proved him deeply and wisely interested), but because his personal work was needed at the bank. He did finally accept a seat in the lower house, and in 1860 he was made a noble of the kingdom for life. Not long after he became president of the board of education, a work much to his taste, and his influence was felt in the building of more and better schoolhouses all over the kingdom.

When the writer left these islands in the fall of 1865 he by no means severed his connection with things Hawaiian. In Boston was a club of former Hawaiian residents comprising more than fifty, most of them familiar with the Hawaiian language; of this club he became a member and later was for ten years its president. This club did not a little for reciprocity and strongly favored the purchase of Pearl Harbor as a future naval base, and there are many old residents who remember the pleasant receptions given by this club to visiting Hawaiians.

Before his death Kamehameha V. offered the succession to the throne to Mrs. Bishop but she declined. Then Lunalilo became the last king of the Kamehameha line, and Mr. Bishop was urged not only by prominent citizens, but eagerly by the king himself, to join his cabinet in which he became Minister of Foreign Affairs. This reign was short, but on the election of Kalakaua, the riots started by Queen Emma's followers gave the minister the chance to ask the commanders of the naval vessels in port to land troops to quell the disturbance while some other of the government officials were frightened out of their wits.

The opposition of the British element (which had naturally espoused Queen Emma's cause), led by Gibson (who in time became Premier and was finally banished the kingdom), put an end for a time to the Pearl Harbor project.

When the Bishops visited the Eastern States the writer had the pleasure of taking them to Harvard College. It was vacation time and there were piles of rubbish near an almost com-

pleted dormitory, on one of these piles a clump of succory had taken root and its blue blossoms attracted Mrs. Bishop so completely that she broke away from us and climbed the pile, returning in triumph with a bunch of the flowers and exclaiming, "Oh, this is the first time since I left home that I have had a chance to pick flowers!"

On my way to the islands in the summer of 1880, to view the expected eruption of Mauna Loa, I saw Mrs. Bishop for the last time at the Severance home in San Francisco. In Honolulu Mr. Bishop welcomed me as of old, but the table in Haleakala seemed deserted without the lady host. Four years later she died while her husband was building better accommodation for her in the house, on Emma street, which the Princess Ruta Keelikolani had bequeathed to her, and where Mr. Bishop resided until his removal to San Francisco after Annexation. It is difficult for new-comers to understand the change that came over these islands, socially, in the political change, but Mr. Bishop felt it keenly; while approving annexation as the only way of protecting the group from Oriental capture, he thought it wiser to remove to San Francisco where he had important interests, and he never revisited his island home.

What he did for that home has been often mentioned in part, but it cannot too often be brought to the memory of the dwellers in, or the visitors to, these islands how much apart from the indescribable but perhaps more important private influence of their lives and charities this couple gave to public charities. For years it was common when charitable or religious institutions found at the end of the year that they had exceeded their income for the treasurers to call on Mr. Bishop to make up the deficit, and he almost always responded. Because he was a staunch Unitarian he often helped the needy churches of various denominations on these islands.

It has been mentioned that Mr. Bishop was a trustee of Oahu College, and as his interest was strongly educational it was there that some of his larger public gifts were made; besides endowments there were the Scientific Building, Pauahi Hall, and the C. R. Bishop Building for the preparatory classes, permanent monuments. I do not know that his influence was be-

hind Mrs. Bishop's establishment by will of the Kamehameha Schools, but he has always taken keen interest in the foundation of the Princess Pauahi and to it added the recitation building and the chapel, both permanent buildings in stone, and also the temporary wooden building for the Preparatory School.

Six years after her death Mr. Bishop completed (as he supposed) his monument to the memory of his wife, the Bernice Pauahi Bishop Museum. It was, I believe, the first cut-stone building of native stone in Honolulu, and consisted of two small exhibition rooms and a picture gallery in the second story. This was intended merely to contain the relics and generally the Hawaiian matters that had come to the beloved Alii from her people who were devoted to her, or from chiefs whose heir she was. This was built in the midst of the grounds of the Kamehameha Schools, and was to be cared for by the teachers of the Schools, a merely school cabinet of curiosities. I had, before I came to reside in these islands in 1888, some correspondence with Judge S. B. Dole and Dr. C. M. Hyde concerning this Museum, but when I found it was to be simply a mortuary chapel, as it were, of relics, I lost all interest in it, and devoted myself on my arrival at Mr. Bishop's request to collecting material and making photographs for a History of Hawaii, and for two years, with Mr. Acland Wansey, I scoured the group for facts and views; then finding that my old friend Dr. W. D. Alexander was already engaged in writing such a history I gave up the plan, feeling that he could do the work more thoroughly, and decided to continue the practice of law. I had not visited the Kamehameha Schools nor seen the building that was nearly complete in the village of wooden structures that then constituted the Schools, when one afternoon Mr. Bishop came to my house and asked me to drive over with him and see what he had done. There was no floor in the entrance hall and the rooms were empty, even the stairway had not been built; he had before this showed me at his house some of the things to be placed in the rooms when ready, and he asked me to arrange the collection in the finished building. This I agreed to do that I might thus show my respect and affection for the memory of my friend. This is not the place to detail the growth of this

small beginning; wing after wing has been added, but at the time of Mr. Bishop's death the original plan was incomplete, and the fine building that had grown at the original giver's expense was not large enough for a proper scientific arrangement of its present contents, leaving out of view the probable future increase. The institution had ceased to be a mere curiosity shop, and had become well known all over the museum world by its publications which perhaps received more attention than they deserved coming from tiny isles in the midst of the great ocean, and made known the name of the founder and those of his trustees to all the principal libraries and museums in the civilized world; it was a working museum, and instead of amusing or instructing a few children of the Schools, it was attracting more than 1,500 visitors a month, and, better still, *students* from other parts of the world to its unrivalled Hawaiian collections.

It has been suggested that as Mr. Bishop built the present structure to the memory of Mrs. Bishop, the two much-needed buildings, the library and a hall for the Melanesian collections, should now be erected to *his* memory, thus combining the monuments of the two greatest benefactors of Hawaii.

HAWAIIAN MUSIC

From a paper written by Helen Grace Cadwell, Oahu College, delivered before the National Education Association at its recent Congress, San Francisco.

THE Hawaiian Islands were discovered by James Cook, an English naval captain, in 1778. References and description found in the records of his voyages, and those of the early visitors to the islands, give but meagre knowledge of the old Hawaiian music. These reports speak of a "solemn kind of song" that was accompanied by only one kind of musical instrument, the drum, made in various sizes. It has become known since, however, that they had other instruments, both wind and stringed. These seafaring visitors were not musicians and their reports are somewhat indefinite and conflicting. Cap-

tain Cook and his officers seem to have been uncertain whether the Hawaiians sang in parts or not, but two other officers, Captain Burney and Captain Phillips, were strongly of the opinion that they did sing in parts; that is together on different pitches. Just the harmonic relation of these pitches was not given and probably not known.

It is to be regretted that some musician could not have visited the islands during the reign of Kamehameha the First, and preserved the music in some authentic score. Kamehameha lived from 1736 until 1819 and during his reign united the islands into one kingdom.

The Hawaiians are a part of the whole Polynesian family and some of their oldest chants record the voyages to and fro from Tahiti, or Samoa, the voyagers traveling in fleets of canoes and steering by the stars.

In an article in the HAWAIIAN ANNUAL for 1904, Mr. B. L. Marx speaks of Fornander's attempt to prove an Aryan origin of the Polynesian family and quotes the Greek word "melos" (a song or strain, the music to which a song is set) as being identical with the Hawaiian word *mele* (a song or chant). Mr. Marx says there is undoubtedly "a strong resemblance in some respects between the epic poem of the Greeks and the *mele* of Hawaii, both being recitations in metric form of the power and glory of dead ancestors as well as of living heroes. The exploits of Kamehameha the First, in hand-to-hand encounters, in spear exercises and courage in battle, as recited in his *mele*, compare favorably with those of Achilles at the siege of Troy, as sung in the "Iliad".

The *mele* included all forms of poetical composition intended for chanting. By Professor Alexander they were classified in four divisions: 1st, the religious chants, prayers and prophecies; 2nd, *Inoas*, or name songs composed at the birth of a chief, in his honor, recounting the heroic deeds of his ancestors; 3rd, *Kanikaus*, the dirges or lamentations for the dead; and 4th, *Ipos*, or love songs.

The history of Hawaii can be traced only through the ancient *meles*, poems without rhyme or meter, but strictly accented, often several hundred lines in length and handed down

orally for many generations. According to Dr. Marques, in the *Hawaiian Annual* for 1914, "Hawaiian meles were very clearly divided into regular phrases of two and four bars of equal time, and every verse was made up of eight or sixteen bars. If the poetry was deficient in length, the singers or dancers made up the deficiency by counting time or bars, while the movement was kept up by the accompanying instruments". Rhythm of 2-4 and 4-4 seemed most natural to the old Hawaiians and the ancient meles were characterized by remarkable changes of time, and syncopated effects. They were greatly lacking in melody, as before the arrival of the missionaries in the nineteenth century, the Hawaiians had no acquaintance with the full range of the intervals that make up the diatonic scale. They had a limited use of intervals that might be compared to the third, fifth and fourth, and like the Arab and the Hindu, they appreciated intervals smaller than our half tone. This ability to recognize and use intervals more diminutive than our half tone, is an interesting fact and has been found a possession common to all Polynesian races. This fine distinction of intervals gave a certain quality of tone color to their chants. As Dr. Emerson describes in his "Unwritten Literature of Hawaii", "The voice goes wavering and lilting along like a canoe on a rippling ocean. Then of a sudden it swells upward as if lifted by some wave of emotion; and for a time it travels with the same fluctuating movement, soon descending to its old monotone until again moved to rise on the breast of some fresh impulse. The intervals sounded may be as already said, a third, a fifth or a fourth, but the whole movement leads nowhere—it is an unfinished sentence."

Hawaiian poetry surpassed Hawaiian song in power to move the feelings. The rhythmic chant was only an accompaniment to the poetry. Dr. Emerson also says: "The hall-mark of Hawaiian music is rhythm, for the Hawaiians belong to that class of people who cannot move hand or foot, or perform any action except they do it rhythmically. Not alone in poetry, music and the dance do we find this recurring accent of pleasure, but in every action of life it seems to enter as a time-keeper and regulator whether it be the movement of a fingerful of poi to the

mouth, or the swing of a kahili through the incense-laden air at the burial of a chief."

Musical phrasing was arranged to fit the verse of the mele, not to express a musical idea. The cadencing of a musical phrase in Hawaiian song was marked by a peculiarity all its own. It consisted of a prolonged trilling or fluctuating movement called *i-i* in which the voice went up and down in an interval somewhat less than a half tone. This was more extensively employed in the *oli*, which was more of a lyric utterance, a songful expression of joy, or a humorous narrative.

The phonics of Hawaiian speech lack the sounds represented by our alphabetic symbols b, c or s, d, f, g, j, q, x and z, a poverty for which no richness in vowel sounds can make amends though the predominance of vowel and labial sounds give charm to the language. The uppermost vocal cavities are not called into play to modify and refine the tone, and therefore a certain characteristic which has been described as a "gurgling throatiness" often appears which is "suggestive of ventriloquism". This is caused, possibly, by a rapid utterance of different vowel sounds, or a repetition of the same vowel. The vocal execution of Hawaiian music, like the execution of much of their poetry, showed a surprising mastery of a certain kind of technique which required the chanting of many lines to the end of a certain period on one breath. The performer then breathed anew and started on another seemingly endless phrase. This appears to have developed from the old religious style of prayer-recitation in which the priest was required to repeat the entire prayer on one breath. His ability to do this was supposed to make the prayer effectual.

The modern *hula* which has embodied movements and suggestions to interest curiosity, chiefly, in some of the foreign visitors to the Hawaiian Islands is not the *hula* of ancient time. The *hula* is claimed by one writer to have been a religious service which combined pantomime, poetry, music and the dance. It was enacted in honor of the goddess Laka and furnished entertainment for the chiefs and their retinues. It included the mysteries of Polynesian mythology and the history of the nation, and in other countries under certain circumstances would

have developed the drama, opera and literature. The dance in ancient Hawaii was not indulged in informally. It was given by trained and paid performers as the hula was a difficult accomplishment which required long and rigid training in both song and dance and was a service said to have been guarded by priestly rites.*

A structure called *Halau*,† was specially erected for the performance of the hula and in contrast to the bloody offerings of the heiau, or temple, garlands and awa were brought as emblems of light-heartedness and joy. During the erection of the halau, the strictest rules were observed. The members of the company were required to deny themselves certain articles of food and to refrain from all impropriety of conduct. In every halau there was a bower of green leaves which was supposed to be the abode of the deity whose presence inspired the performance.

The devotees of the hula worshipped many gods but the Goddess Laka was the patron of this service to whom special prayers and offerings were made. The leaves and flowers decorating the altar were symbolic of her beauty, for she was a sylvan deity who might be compared with Terpsichore and Euterpe, the muses, respectively, of dance and song. * * * *

Hulas varied in dignity and rank and the character of each was influenced to some extent by the musical instrument that accompanied it and gave it its name. One of the highest rank was the stately *hula ala'a-papa* which might be compared to the courtly minuet. The songs used in this were many and varied, and their origin referred to a remote past termed by the Hawaiian "wa-po"—time or period of darkness; chaos. Among these meles are some concerning *Pele*, the Goddess of Fire, and the members of her numerous family. The only instrument used for accompanying this hula was the *ipu*—a kind of drum made from two large pear-shaped gourds of unequal size, joined

* Note—This was far removed, however, from the conception or idea of religious worship; present-day Hawaiians ridicule such a notion.—Editor.

† The *halau* was a flat top, open, shed-like structure of temporary character, covered usually with coconut leaves. Sometimes a portion of one or both sides are leaf-enclosed, as a wind-shield, rather than for privacy.—Editor.

together at their smaller ends. In the top of the smaller one a hole was made to increase the resonance. The musicians rested upon their heels and rose only as far as the bended knee would permit, in moments when the action became excited. The ipu, lifted lightly, was struck on the ground on the accented beats and patted with the hand on the unaccented. * * * *

The *hula pahu* received its name from its instrument of accompaniment, the drum—*pahu*. From tradition we learn that *La'a*, a man of rank who lived five or six centuries ago, introduced this big drum, which he brought on one of his many voyages from Southern Polynesia which land the Hawaiians called *Kahiki*. The *pahu* was made of coconut wood and covered with shark skin on its upper end. It was beaten with the hand and gave forth a deep religious tone. Its original use is said to have been in connection with the service of the temple, and its transference to the *halau*—hall of the hula—gave dignity thereto. A splendid drum of this type was noticed among the collection of Hawaiian instruments at the Bishop Museum which Dr. Brigham, its director, kindly showed and explained to the writer. With the *pahu* was used a small drum called *puniu* made from a coconut shell and fish skin. This was strapped to the thigh and played with a thong of braided fibers. The *pahu* was sounded at longer intervals, giving accent to the rhythm kept by the crisp tone of the smaller drum.

Other instruments used in the hula were the *uli uli*, a small gourd filled with seeds, and the *puili* or bamboo sticks which were splintered into fine divisions at one end and gave forth a rustling sound, when shaken in the hand, as of wind in the trees. The *laau* was a sort of xylophone, which consisted of two pieces of resonant wood, one struck against the other. The *ili ili* were two pebbles used in one hand in the fashion of castanets. An instrument of historic age was the *ukeke*, a strip of wood bent into the shape of a bow, the elastic force of which held tense the strings stretched upon it. One end of the bow was placed against the lips while the musician talked to it in a singing tone and plucked the strings with a rib of grass, the open cavity of the mouth acting as a resonator as it does with the jew's harp. Of wind instruments there was the conch shell,

the early Hawaiian trumpet, inciting men to war and deeds of heroism; the *pua*, a small gourd played somewhat in the fashion of the Italian *occarina* and the *ohe*, or nose flute, which was made of bamboo and supplied with air from the right nostril of the player. There were two holes for the use of the fingers so that three tones were possible. One of these instruments, in Dr. Emerson's collection, produces the tonic, mediant and dominant of the chord F-sharp minor.

From the ancient hulas accompanied by these primitive instruments to the modern songs, which many visitors think are typically Hawaiian, is a wide step, yet one reached by a gradual process.

The American missionaries arrived in 1820 and began the study of the Hawaiian language that they might give it back to the people in a written form. The original alphabet adopted by them contained twelve letters, five vowels a, e, i, o, u and seven consonants h, k, l, m, n, p, and w. The first Hawaiian spelling book was printed in 1822, and as fast as possible the Bible and hymns were printed in the native language. These missionaries taught the Hawaiians the diatonic scale and named the notes of it *pa, ka, li, ha, no, la, mi*. The use of more melodic expression for their poetic natures was readily adopted through the means of the diatonic scale, and the new music of the foreigners appealed to the people greatly. Their feeling for harmony was remarkable and in the last century part singing has afforded them much pleasure.

The modern Hawaiian songs are nearly all love songs. They are usually of simple, flowing melodic construction, and at times one notes a similarity to the old German folk songs. This may be due somewhat to the influence of Captain Berger, a German musician who for over forty years has conducted the Royal Hawaiian Band, which has been a great factor in the musical life of the Islands. Captain Berger has been enthusiastic in his interest in the musical growth of the Hawaiian people and is known as the composer of the music of the national hymn "Hawaii Ponoi" which, translated, means Hawaii's own true sons. The words of this song were written by Kalakaua, the last king of the Hawaiian Islands, who reigned from 1874 to

1891. Kalakaua was a lover of music and greatly encouraged the art among his people. It was in the early part of his reign that the *ukulele* was introduced. This is an instrument of Portuguese origin, shaped like a small guitar and strung with four strings. The name *ukulele* translated is "jumping flea", and supposedly refers to the rapid movement of the fingers plucking the strings. The use of the *ukulele* has become widespread in the islands and the instrument affords an effective accompaniment for the deep, rich quality of the Hawaiian voices. On moonlight nights, and particularly on an evening before a holiday, one can hear groups of students and Hawaiian youths serenading. The beauty of the night in this tropical land lends an indescribable charm to the plaintive notes of their love songs.

An excellent opportunity for hearing Hawaiian music is afforded by the glee clubs of the large native schools Kamehameha and Kawaiahao, and by the Hawaiian singing boys of Honolulu. Occasionally concerts are given in the Royal Hawaiian Opera House under the direction of Mr. Charles King, who has made a study of the subject. Only a few of the old Hawaiians are living who once learned the art of the weird chanting and still remember the long meles which taxed the memory of their youth. * * *

Queen Liliuokalani is well known as a modern Hawaiian composer. She lives quietly at Washington Place in Honolulu, and, though frail in health, at the age of seventy-seven still takes much interest in the life of her people. In a visit to her home recently I found her seated between two royal *kahilis*, with her lap full of roses, which enhanced the beauty of her white hair and the simplicity of her black *holoku*. She was most gracious and told with animation of her love for music, of the inspiration a composer feels, and of the meles that were written in honor of her ancestors according to the ancient customs. It was a great honor she conferred in sending for one of her old retainers, who with the admirable dignity of carriage and manner characteristic of the Hawaiian matron, appeared at the doorway in an immaculate white *holoku* and yellow feather *lei*, the royal insignia, and chanted in weird and long-sustained tones one of the royal meles only heard on state occasions. As she chanted

and portrayed with many gestures, the scenes described, the Queen explained the meaning thereof, and told how difficult of translation is the poetic thought embodied in the highly figurative language of the Hawaiians.

One line referred to a great cliff over-hanging the sea. This not only pictured one of the scenes surrounding the birthplace of the great chief, the Queen's ancestor, but it also indicated his high position among the people. Upon my inquiry about the few English words that appear in her best-known song, "*Aloha Oe*," she said that at the time it was written it was merely fashionable to introduce a few English words, and that they had no special significance. This fashion is noted in other songs of that period when sometimes such words as "mountain breeze," "dew drop," and "sweet dahlia" were inserted. "*Aloha Oe*" was written as a farewell, and the inspiration for the words and music of this composition was furnished by the fond parting embrace of two lovers, whom the Queen discovered when returning over the *pali* from a horseback party on the other side of the island.

Music in Hawaii has departed greatly from its primitive characteristics and now savors largely of the influence of the outside world, yet it issues from the hearts of a simple, kindly people who still love nature in all her beauty and varied forms. They still hear her voices in the gentle winds, the waterfalls and the waves lapping on the shore. They feel her warmth in the sunshine of eternal summer and see her touch in the rainbows and the flowers. Nature is glorious in Hawaii's peaceful isles and such lavish gifts in any land could inspire only poetic thought and offer a romantic influence to the musical expression of its people.

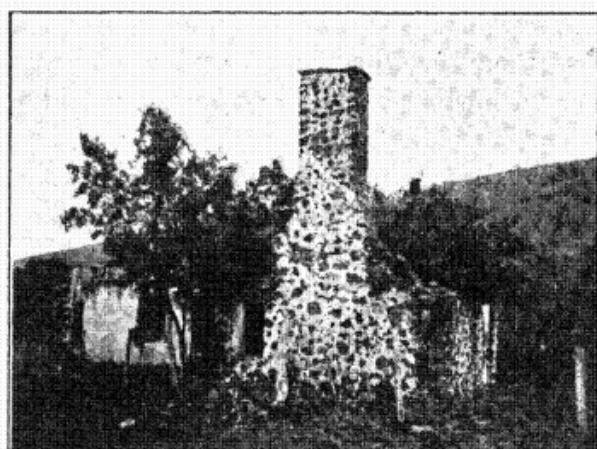
STEPS are in progress toward the establishment of a Kukui Oil factory, public attention thereto as a lapsed industry having had frequent mention in the ANNUALS since 1893. It is planned to incorporate on a capital of \$25,000, with privilege of increase as the business develops. Rights to gather the nuts on government forest reserve lands is reported secured.

BETWEEN THE BAYS IN KONA

BY ALBERT S. BAKER, M.A., M.D., B.D.

IT is a most interesting bit of shore, the ten or a dozen miles between Kealakekua and Kailua Bays. Some of the features have been described in former volumes of this ANNUAL, but not all of them, nor have they been located relatively to each other.

There is a heiau at Keei, the southern point of Kealakekua Bay, in which human bones may still be found, but there is a far more interesting heiau at the tropical village of Napoopoo, beside the pretty sandy beach with its pond just back of it. At this very ancient heiau, named Hikiau, Capt. Cook was worshiped, and this is the place from which he took the fence and



Forbes-Ives House, Napoopoo, 1832-1845.

au. Obookiah was born in Kau in 1792, but at the age of twelve lost both parents in one of the prevalent local brawls.

Just above Napoopoo village is the stone remains of an early mission house, occupied by Forbes and Ives, though the station was first established at Kaawaloa by Ely and Ruggles, and later moved mauka by Mr. Paris. Slanting up the pali on the Napoopoo side can still be traced the old trail up which an idol used to be carried in the regular processions across to Kaawaloa, hence Ke ala o ke akua—the way of the god, Kealakekua.

At Kaawaloa, across the bay, back of the monument near

paehumu images
f o r fire-wood.
Opuhakaia o r
Obookiah, w h o
reached New Ha-
ven in 1809 and
attracted much
attention to the
islands, also lived
here for a time
with his uncle,
who was priest
of the back sec-
tion of this hei-

where Capt. Cook was killed, described in the ANNUAL of 1912, is the high pali full of burial caves, both ancient and modern. Sticks may be seen in several openings at inaccessible points high up, which helped to close the caves until earthquakes and time tumbled away the covering rocks. Some years ago the writer was taken by three Hawaiians into the Hoaeku cave here, a burial cave of the old royal chiefs. After crawling through a narrow passage for a short distance from the unprepossessing entrance, we reached a larger part some one hundred feet long, literally crowded with bodies. There were some fifty bundles of bones, perhaps a dozen canoes with outriggers removed and laid beside them, one with an ancient surf-board cover, some dozen ancient coffins, mostly full-sized, and a few ship's sea-chests full of bones. The bones in the bundles had been cleaned before burial and tied together with olona, a white string made of a tough grass, and then wrapped in many folds of tapa, which were tied up with sennit, a rope made of coconut fiber. There were other varieties of string, and there were many varieties of once beautiful tapas, as well as fine brocade silks, etc. The bodies in the coffins and canoes were quite intact, dried, though the tapas and silks were more or less rotted. Pulu, salt, etc., were used as preservatives for the bodies. In the canoes, at the feet, we found a kou hand-wrought calabash, a coconut calabash, and a gourd water bottle, all somewhat damaged. In one canoe was a large bundle of many wrappings of tapa, which, after long unrolling, proved to contain only a single lock of hair. The whole place had been ransacked, as shown by the confusion of wrappings. We, however, were careful to replace all wrappings, including many of those scattered by the carelessness of our predecessors.

Something like a mile up the trail, and just out of sight, is the oak cross and copper tablet erected in 1825 by Byron of the *Blonde*, where the flesh of Cook's body was removed from the bones and burned. The ancient salt works beyond the kuula or fish heiau at Kaawaloa are also interesting. They are large stones hollowed out for the evaporation of sea water. Most of them have been removed, in building the lighthouse, though several show well both on the inside and the outside of the north-

west corner of the wall around the lighthouse enclosure.

Passing north over the ancient trail to Kailua, built by Kuakini (or Governor Adams as he was called from his having adopted the name of President John Adams), bordered by the smooth stepping-stones of a still older trail, we reach Puuohau, the volcanic cone on the shore which divides North and South Kona. Many enclosures which were the sites of former Hawaiian homes are passed, and at Kainaliu beach we reach the sight of Kaona's insurrection of 1868. The grave of this false prophet is near the foundations of his big church, which was only just begun.

Next, a short distance before Keauhou, is the battlefield of Kuamoo, where Kekuaokalani, with the adherents of the old order, met the king's forces who were upholding the renunciation of idolatry and the breaking of tabu, in 1819. This place is full of interest, in that the battle taking place at the edge of the bare lava, the bodies of the slain were buried on the lava with from one to twenty in a grave, and the various huge mounds of stone show today just above the trail as plainly as when first made. The mounds are so irregularly placed that it is almost impossible to count them, but there are probably over a hundred mounds of all sizes, with from 1,500 to 2,000 bodies. A few high mounds may be over the bodies of chiefs or priests. An old man, whose grandfather had told him of the battle, showed us how the battle began by the graves at Keauhou 2, and how the rebels were pushed back across Honalo and Maihi to the last stand at Kuamoo, where Kekuaokalani and Manono, his wife, fell side by side. A few fugitives are said to have escaped by fleeing up a lava tunnel entered by a shore cave just south.

At Keauhou, on a pretty little bay part way between the other bays, is a well-preserved papa holua, a broad, well-built, undulating toboggan-like slide, built before his reign for Kamehameha III to slide down on sleds, with his friends, over the grass-covered slide made slippery with kukui-nut oil. The slide used to pass out behind the chapel on the north arm of the bay. There the prince and his friends would take surf-boards and return by water to the head of the bay. After the prince had started the sport, others might slide as well. Originally the

slide was over a mile long, about three-quarters of a mile still being in good condition. It is fifty feet wide for the entire distance, and across one hollow it is raised ten feet. Kamehameha III was born at Keauhou, and a stone tablet was placed at the site in the summer of 1914, by the Daughters of Hawaii.

Mauka at Keauhou is a small heiau, on which was found, fairly recently, a lava mold of a tree with a rude face on the outside, most of the features of which are natural, though one eye had been rounded artificially. This stone represented Lualii, god of canoes. In cutting koa trees up the mountain for canoes, the omens had to be just right. A certain bird (the elepaio) in a tree was a bad omen; and it was rightly so as the bird went for a worm in the wood, which thus was not sound. On one occasion the men had great luck, for by night forty good trees were cut. Though troubled by a voice which seemed to say, "These trees are all mine", they saw no one, and they went away a short distance to their camp for the night. In the morning, however, not a tree remained, but where the trees had been was found this stone with a rough face. They concluded that the voice must have been the voice of Lualii, god of canoes, the story goes, and this stone was taken down to the heiau as the idol.

A half-mile north of Keauhou is still found a short branch trail to the shore, of ancient stepping-stones brought from the beach at Keauhou. Another half-mile brings us to Kahaluu, an ancient sacred locality of many heiaus, some showing huge stones set well up in the walls. At Hapaialii heiau Hewahewa was priest, the chief who joined Kamehameha II in the overthrow of idolatry. Near the southwest corner of the southern heiau, Keeku, on the shore ledges just beyond the reach of all but the highest waves, are the ancient petroglyphs, similar to those described in the 1904 and 1906 Annuals. By the upper side of the trail just before the stone church, is a part of the old execution stone used in Kuakini's time, with a hollow for the body of the victim and a hole through which a rope was passed and drawn taut for strangling, though in this case it generally broke the neck. Just a little above, and continuing all the way to Kailua, is the huge stone wall built in Kuakini's time to keep pigs from the cultivated lands above. A still larger wall may be

seen mauka of Kainaliu, built for the cattle landed by Vancouver in 1793.

Passing on toward Kailua, we may see several heians and the beginning of the old so-called Judd road, built for fifteen miles toward Hilo by compass, until the Hawaiians struck lava flows and refused to further risk offending Pele. Above on the plain, are several cones over which the trail runs instead of passing around them.

At Kailua stands the large stone church erected in 1836, with the memorial arch erected in 1910 to commemorate the landing of the missionaries at this place in 1820. The incentive for this arch was a visit by some of our Hawaiian ministers to the Pilgrim monument at Plymouth in 1899. Ancient heian stones of Umi's time, from near by, were used both in the church and arch. Just across the road is the old palace built by Governor Kuakini,

Thurston House, Built 1834.

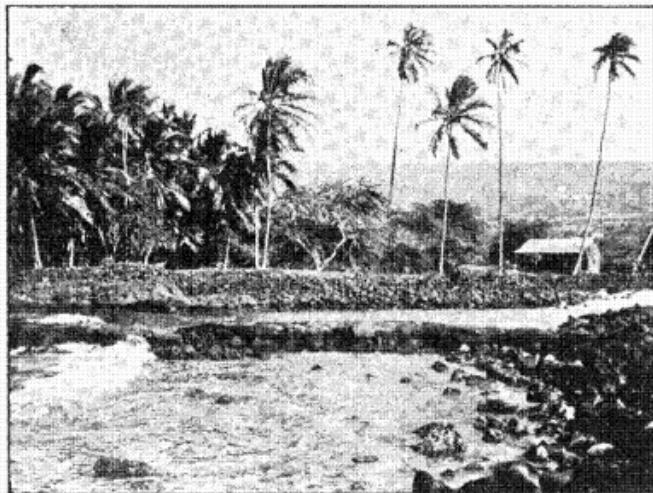


Bishop House, Built 1831.

used as a summer home by the later Kamehamehas, and finally bought by King Kalakaua. South of the church is the stone ruin of the old Bishop house built in 1831, and a short distance up the Holualoa road

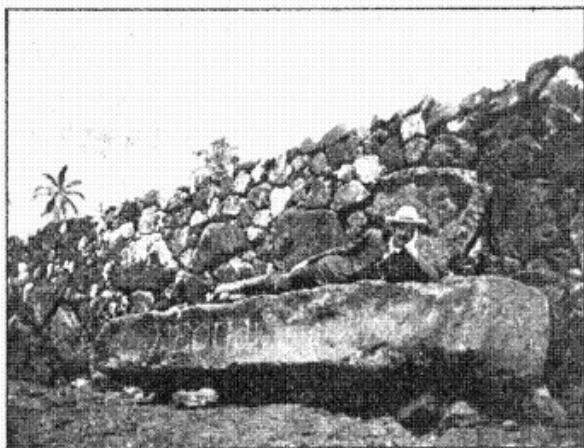
are the remains of the wooden Thurston house brought around the Horn and erected that same year. In the yard at the latter place is the entrance to Laniakea cave, with a lava tunnel leading above, which fugitives are said to have used in escaping from their enemies, and a lower section with a large pool of slightly brackish water at the end, where people occasionally have an

under-ground swim. Kamehameha the Great lived the last seven years of his life and died at Kailua, and the whole section is full of historic interest.



Site of Hale o Kauila, City of Refuge, Honaunau.

Some miles north of Kailua are the Kaloko fish ponds and various heiau sites, but nothing of much importance. We must include mention, however, though outside our limits, of the partially restored City of Refuge at Honaunau (see 1908 ANNUAL), a few miles south of Napoopoo, which lies on the southern shore of Kealakekua Bay, and across the ground on which Kamehameha fought the



Keoua's Stone, City of Refuge, Honaunau.

battle of Mokuhai in 1782. There within the walls, which are some 12 feet high by 15 feet thick, may be seen the huge Keona and Kaahumanu altar stones on either side of Alealea heiau, the place of games; near the latter stone an excellent konane game stone; the small woman's heiau; the southern gate location; and remains of the walls on the sides by the sea. Just north of the main entrance of the City of Refuge, are the terraced platforms of the Hale o Keawe. Near a coconut tree by the first terrace and a part of the step, is the sacrificial stone. Underneath are still traces of vaults where the bodies of kings once rested. At the water's edge to the west are some excellent spout-holes, though surpassed by some at Kawaloa beyond the point. A huge stone near by, overturned by a great storm some years ago, is said to have a crude astronomical system cut on its under side.

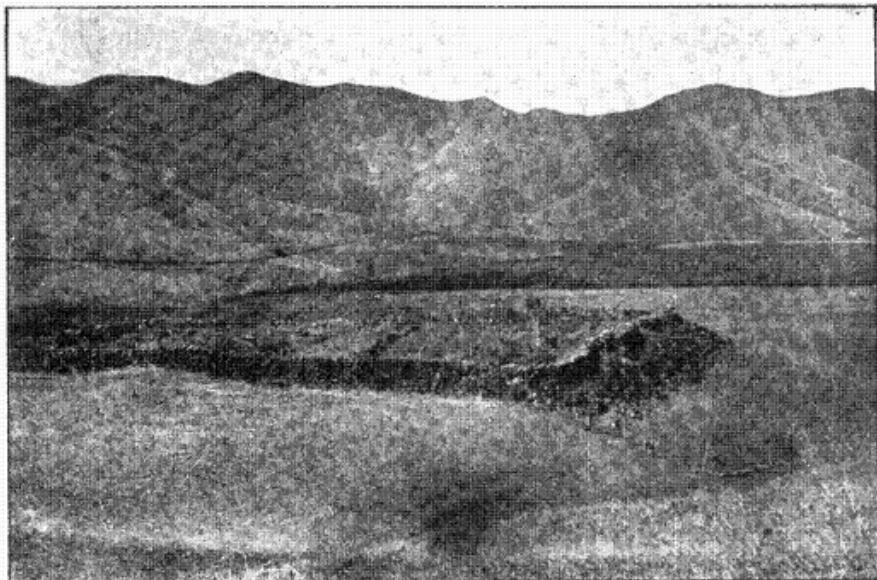
At the east of the City of Refuge are three royal enclosures, which were cleared of rubbish a few years ago by Mr. J. D. Paris, who also planted grass and set out coconut trees. There was a beautiful grove already in



Main Entrance, City of Refuge,
Honaunau.

one enclosure, where a shelter with table and seats for visitors have been erected, and there is a pond in another enclosure. The Hale o Kauila was in the middle section. It is a pity that this place is not more accessible.

A NEW Sydney-Honolulu record was made this last summer by the Oceanic S.S. *Sonoma*, by her arrival here, July 16th, in eleven days, nineteen hours from Sydney, reducing the record hitherto held by the Canadian-Australian line S.S. *Manuka*, of thirteen days, eleven hours, nine minutes.



MAKINI, OR MOOKINI HEIAU, KAILUA, KOOLAU, OAHU.

COMPLETING OAHU'S HEIAU SEARCH

BY THOMAS G. THRUM.

AFTER long interruption in the assumed task of investigation of the ancient temple sites throughout these islands, an opportunity presented itself this past summer to resume my searchwork thereon that was gladly availed of for a personal inspection of the unexplored parts of Koolau, and thereby complete the list of heiaus and heian sites to which Oahu is entitled. Naturally the long delay in the inquiry has not resulted in recovering all that hope had lured one on in the endeavor. This fact may be balm for disappointment to certain expectations, though not of the healing kind when, at the end, the personal search results in shattering some of the pet historic idols of the district.

Traditions for ages past has credited the heiau of Alala, in the Kailua section of the Koolau district, as having the distinction of being the temple where the ceremonies attending the royal birth of Kualii, about 1640, were performed, but of which no traces of any kind now remain. On the contrary, the site to which we were directed, while convenient and appropriate for

a ko'a, or fisher-folks' heiau, gave no evidence by stones of the vicinity, contour of the hill at the point shown, or other feature, of ever having been the location of a temple of the importance alleged.

As if to compensate for the erasure of Alala from the list of Kailua's temples was the learning of two others in that section, hitherto unreported, namely, Kanahau, a small-sized structure of the hoolulu ai, or husbandry class, and Heinau, on the land of Kaopa, Kawaikoko, of good size, still standing in fair condition, and credited as of the hoolulu wai class, the first of the kind met with, said to have connection with a disappearing spring in the vicinity.

In this first day's quest I was handicapped by sustaining a sprained foot, but through the experienced services of Mr. J. F. Stokes, of the Bishop Museum staff in like heiau investigations, we spared not ourselves in the chosen search, but sought to make the most of our opportunity. Through this mishap, and disconnection of conveyances, Waimanalo was not visited for the particulars of the two temples listed in that part of the district, nor did my inquiries elicit intelligent reply.

Considerable time was given to the investigation of the Ulupo heiau. This was found, readily, on the left-hand side of the road toward the coconut grove and beach lots of Kailua, in plain sight, adjoining a cattle pen of liberal dimensions. A grove of varied sheltering trees lend attraction to the locality. Ulupo is one of the famed temples of structure so ancient as to be credited to the Menehunes, and, as usual, with stones brought from long distance passed from hand to hand. Tradition varies as to the location of their natural quarry supplying the immense amount of stones for its building, some crediting it to Kualoa, some twenty miles distant, others again to Ewa, and even distant Waianae, the route for which could only have been over the Pali, and imagination may picture the pathway of their time for such a task.

But aside from any such fairy story, the ruins of Ulupo possess deep interest. It is of open platform character, peculiar in its shape through the contour of its site, but measuring in the main 140 by 180 feet. Natives in the vicinity speak of it as a

pile of rocks, and such it is, rather than a walled structure, for little evidence exists of main retaining walls on the side and end extending into the valley. On the southern end a semblance of orderly construction still remains. In so exposed a location, prone to the trespass of cattle, etc., in the grazing and stock-raising periods of this district's industry, the damage to the old temple has been naturally great. How much this has been assisted by desecrating hands is difficult to judge, though it is evident from the disturbed paving throughout, and the removal of marked temple features, that it has been changed to serve some more modern purpose.

Another important heiau of this Kailua section was found in Kaonia, on the Kapaa slope, facing the range of hills dividing Kaneohe. This had been reported as Makini, but is generally known to the people of Koolau as Mookini, the same as that of Paaō's first temple at Puuepa, Kohala, Hawaii. This Kailua heiau, like its namesake, is a walled structure, measuring 120 by 180 feet, laying N. W. and S. E., with an adjoining structure on the northern side 32 by 38 feet, though this may be of modern service. Unfortunately a heavy growth of guava, lantana and other shrubbery within the heiau enclosure precluded the possibility of an examination of its features, to learn its condition and judge its character, which doubtless, like Ulupo, was of the pookanaka—or human sacrifice—class. Along one end of the structure a ledge several feet in width ran probably its entire length, somewhat resembling a prominent feature of the temple of Puu o Mahuka, overlooking Waimea, Oahu, and like it, its paving had been disturbed to permit some agricultural effort.

Some little distance up the slope of the hill was a rocky ledge from which an advantageous view of the heiau would have been obtained but for the dense growth referred to. It proved of interest, however, in possessing a large, flat stone with a peculiar natural grooved surface, and of sufficient size to accommodate a man's body if it had any connection with the ancient temple sacrifices. The very sight of it suggested the query.

No Hawaiian residents of this vicinity were found to throw even traditional light on the history of Mookini; all were dead, or had moved elsewhere, and their places were taken by Chinese

in the culture of taro, and a lone Japanese charcoal-burner. This latter proved a good pathfinder for us through stretches of jungle, and a convenient helper in measurements.

Kaneohe furnished us with several names to the list of heiaus, as evidence of the rivalry once existing among the kahunas of that burg in ancient times, viz: Maunahuia, a structure in ruins just below the foot of the pali on the government land of Wakaluawaho; Kaluaolomana, at Puuwaniania, a walled structure of medium size, reported to be still standing; and Kukuiokane, at Luluku, of platform character and large size, now being destroyed.

At Keahala, near the mountain, is one known by the name of Pule, with a lower one—probably connected—known as Kuakala, while at Waikalua, near the beach, once stood the Naonealaa heiau, said to have been the principal of the three. Their size, character, or other particulars could not be gathered.

Some disappointment was experienced on locating the heiau of Kawa'ewa'e on a hill of same name, in Kaneohe, famed in tradition as built in the time of Olopana by his brother Kahikiula, and credited as being the scene of the demi-god Kamapua'a's victory over Oahu's king. There was little about it to identify it as a temple of such fame. We found a walled structure that measured 110 by 260 feet, with walls from four to eight feet in height according to the lay of the land. Crowning the hill as it did, it took its contour, with a levelled-off portion at the seaward end for usual temple purposes, showing a slight trace of pavement. Much of the heiau was in a dense jungle of shrub growth, still, what examination it permitted revealed but little to distinguish it from an old battle enclosure, or cattle pen, except that it had heavy walls and no gateway.

The name of Mokapu's once prominent heiau, the site later of a Catholic church, and reported as having been of the husbandry class for the once populous neighborhood, with Hina and Ku as its deities, appears to be lost to the old people of the district, as is also the one at Hawailoa, of which but foundation tracings now remain.

To the once large and prominent temple of Leleahina, at Iolekaa, in Heeia, is to be added that of Apili in that same sec-

tion, a platform heiau of medium size, said to be still standing in fair condition.

Waikane's formerly reported large-sized heiau with the odd name of Kukuiianani—glass lamp—is entitled to the credit of a companion structure of small size known as Kaawakoo.

Two are to be credited for the Punaluu section in addition to Kanawao, formerly listed. One of these, named Maka, is located at Nahiku, Makaua-uka (particulars not given), and Kaumakaulaula, near the Punaluu road, this latter being famed as of very ancient tradition, the site only of which now remains, according to the accompanying narrative of Ben Kaoao, a veteran of the valley. Between Punaluu and Kaluanui, on the land of Papakoko, are the foundation remains only of one known as Pupuka.

Nothing of ancient temple character was learned at Laie, or at Kahuku, the fame of both these localities in the minds of their old people being centered more in legendary lore, of which Laieikawai, and the underground stream connection with Wai-pahu, in Ewa, are well known.

Much interest was evinced in the subject of my search throughout the windward district, and material aid rendered at various points. Following a series of inquiries one grandmother remarked on the strangeness of the haole seeking to secure all such matters for historic record, while the Hawaiian people themselves did nothing toward their preservation. This revision of Oahu's list of heiaus closes with one hundred and eight as evidence of the power and sway of kings and priests over the people.

RETIREMENT OF CAPTAIN BERGER.—Following the retirement of Captain Henri Berger, the veteran leader of the Hawaiian Band, last spring, he was signally honored by the legislature in being the recipient of an engrossed series of resolutions appreciative of his faithful service of over forty-three years. This surprise took place in the house of representatives, Speaker Holstein making the presentation address. Subsequently he was voted an annuity in consideration of valuable public services rendered.

TRADITION OF THE KAUMAKAULAULA TEMPLE

AS NARRATED FOR THE ANNUAL BY BEN. KAOAO, OF PUNALUU,
WRITTEN BY L. M. KEA'UNUI.

KAUMAKAULAULA was the temple, and Kamehaikaua the one who built and laid the foundation thereof after the great flood, Kai-a-Kahinalii. Kahonu was the priest, and Kekuaokalani the king. Maliko was the location of the king's house, while Kawaiakane and Kawaiakanaloa were the places where the king was reared in the Punaluu division of land, district of Koolauloa, island of Oahu-alua.

In those very ancient days which are past and gone into obscurity, when the Prince Kekuaokalani was born on the island of Hawaii, his bringing-up was taken in charge by Kahonu, the priest spoken of above, and his royal consort, both of whom were close relatives, *iwikuamoo*, of the prince.

On the third *anahulu* (one month) after the prince had first inhaled the cool airs of this earthly life, the council of chiefs sat in session in accordance with the wishes of the royal guardians of the young prince, to segregate their royal charge to some other island of the group. The council of chiefs, the priests, the omen readers, the statesmen and counselors of the royal court consented to approve this request of Kahonu. And in his capacity as priest, with jealous care and with great regard, Kahonu sought to maintain the dignity and sacredness of his royal charge, for he was of the highest *kapu* rank, *kapu moe*, the prostration *kapu*, by which the breath of the common people mingled with the dust, days now long past, when a man was sure to be killed if his shadow even fell upon the king's house.

When the council of chiefs allowed the petition, Kahonu and his wife made immediate preparation, together with his people, the order of priesthood, his omen-readers, statesmen and court attendants for their voyage by canoes for the island of Oahu, and Punaluu was the destination in accordance with the orders of Kahonu to his canoe-paddlers.

When the fleet arrived off the breakers at Punaluu, it was

evident to the people on the shore that Punaluu was the goal, Kahonu being well acquainted with his birth-place, from which he had gone to reside in Hawaii. The canoes entered the harbor of Mamalu, where vessels now-a-days are loaded with pine-apples from Punaluu. Makaiwa was the landing place of the canoes, where now there is a wharf with warehouses for the convenience of the shipping public.

When the voyagers arrived in Punaluu, Kahonu and his wife took their young charge to the densest part of the forest in the deep solitude of the uplands of the mountains, a place called the Water of Kane and Water of Kanaloa, where the prince was nurtured. The place is still in existence. The priests, courtiers and traveling companions of the young prince were made by Kahonu to remain at Maliko to erect a house for his royal charge, and to repair some deficiencies in the temple of Kaumakaulula herein spoken of.

The house of the chief was so very sacred that the shadow of a man must not cross it, and he who disobeyed and did not observe this law of the sacredness of the chief, death was his sure penalty, and the body of the unfortunate was placed on the altar of the temple, together with prisoners of war.

The fame of the temple of Kaumakaulula became known through wonderful things of a mysterious nature, known only to this temple, which was this: In early times the people dwelt on the lands under the chiefs and division overseers. They raised animals such as hogs, dogs and chickens in those days of darkness, yet full of ingenuity; days in which they asserted that the deity lived with the people and would be kindly disposed to their supplications when accompanied by a cup of awa and the snout of a pig—*ihu o ka puua*.

On the approach of the sacred nights of the temple these omens of wonder and mystery would be observed: the eyes of all the pigs which were near the boundaries of this temple would turn red, and this has been known to happen even down to the present time. That is how the name of Kaumakaulula became applicable and has continued famous to this day. It is spoken of as hidden, “*he heiau huna ia*”, a most sacred temple. Wonderful and mysterious things pertaining to it lay hidden in the

earth. Sounds of the drum, the nose flute, the whistling gourd and the voices of the priests in prayer could be heard by our own ears to our wonder and astonishment during the nights of Kane and of the Kaloas, every six months, and this has continued from its founding even to the present day.

One would be in doubt of this to witness the present desolate condition of this temple site, because it is now but a level field lying in desolation but recently put under cultivation. The temple had but one body but divided for its services into two sections. There was a separate division where the priests performed their ritual services, this was just seaward of the house-lot adjoining on the north side of the stream of Maipuna, and above the bridge and government road. The altar of sacrifice was also a separate place where the bodies of men and other sacrifices were offered up in solemn service. Its site is a *kahua*—a hollow place—now occupied by a lime-kiln, seaward of Ben Kaoao's residence, above the road. My familiarity with the boundaries of this temple site is from long residence here, and its lines having been pointed out by my parents who were old residents of Punaluu. In length it is about six chains along the government road, commencing at the bridge of the Maipuna stream on the south and running northward. It was two chains in width on the south adjoining the stream, and one chain on the north end. The altar and temple services were at the south end, while the house of the priest was at the narrower north end.

The several divisions of the temple premises, known from the time of our ancestors, were as follows:

1. Heiau.—A place to offer sacrifices and other things prepared for the deity, with prayer.
2. Loko.—A place where captives are confined; where the vanquished die.
3. Upena.—A place where fish (victims?) are caught, or ensnared; a sign of death.

In this connection I recall certain prayers repeated by some old people who have long ago passed to the other side, wherein the word net (upena) is used. It is as follows:

"The man-fishing net of Lono,
The braided net of Kamehaikane,
The double net in which the luhia is caught,
The nfuhi, the lalakea, the mano,
The moelawa, the favorite shark dish of the chief."

EVIDENCES OF THE DEEP SUBSIDENCE OF THE WAIANAE MOUNTAINS, OAHU

BY WILLIAM ALANSON BRYAN

Professor of Zoology and Geology, College of Hawaii.

PERHAPS no more clear, succinct, convincing and accessible data for proof of the extensive erosion and subsequent deep subsidence of the Waianae range can be found on Oahu than is to be secured by a visit to Mailiilii, a small isolated remnant mountain, near the railway track, a mile east of the village of Waianae.

The recent opening of a quarry by the U. S. Army engineers in the elevated reef at the seaward end of this mountain, for the purpose of securing material for road construction at the army post at Leilehua, has made a cross-section study of the old reef possible and thus exposed much of geologic interest that has been heretofore hidden. This development led me to revisit the locality on several occasions last March (1915) with a view of securing detailed data from a section I had frequently visited before. I was therefore able to study the immediate vicinity and surrounding country more carefully than on the occasion of the visit to Hawaii of Dr. Wm. H. Davis, last year, when I had the pleasure of conducting him to this, and a number of other, sections of geologic interest on the elevated reefs about Oahu.

Before proceeding to discuss the particular locality mentioned, it would seem proper to review, somewhat at length, the notice that has been taken of this interesting section by the earlier geologists in connection with their general reference to the elevated reefs of the south and west shore of Oahu, in order to make the data on the region available to the general reader.

Reference to the reefs generally appears in connection with their observation on the Waianae region as a whole. Dana was

the first geologist of note to visit and report on his observations on the Waianae region. In his discussion of the "Western Division of Oahu" appearing in the Geology of the "United States Exploring Expedition" (1849) he gives a general outline of the more obvious physical and geologic characters of the region. In another connection he discusses the coral reef rock fringing the volcanic mass of Oahu but ventures no suggestion as to the geologic history of the Waianae mountains.

The next account of the Waianae region occurs in "Notes on the Volcanic Phenomena of the Hawaiian Islands," by Dr. W. T. Brigham (1868) in volume one, part three of *Memoirs of the Boston Society of Natural History*. Dealing with the "Southwest Range" he follows very closely the account given by Dana. In discussing the theoretical formation of the group, he finds evidence of the elevation of Oahu, concluding that "I am much inclined to the belief that Oahu has been elevated nearly two hundred feet since the coast craters were formed."

In his masterly summary of the "Characteristics of Volcanoes" (1891) Dana adds to his earlier and more general observations, stating that: "The mountains of west Oahu cover, at the present time, a much smaller area than those of east Oahu. The original dimensions we have no data for estimating. The highest peak, Kaala, in the northeastern part of the group of summits, has a height, according to the government survey, of 3,586 feet [4,030 feet], which is 681 feet [930 feet] greater than Konahuanui, and besides this there is in the southeastern part other peaks of 3,105 and 3,111 feet. These elevations and the deep and open valleys, divided off by sharp ridges, are sufficient evidence that the mountain range is but a small remnant of the once great volcanic mountain—probably a loftier mountain than that of east Oahu. Denudation has had a far longer time for its dissecting work and has done much to diminish the area it covers. Whether great loss has resulted from subsidence is not ascertained." (Page 301.)

In the same volume when discussing evidence of recent change in level he says: "Evidence of recent upward change of level is afforded by the elevation of the coral reef along the sea border. . . . Along the southern or southwestern Oahu the

height of the reef is fifteen to thirty feet; and I estimated the amount of elevation indicated by it, in 1840, at twenty-five or thirty feet." (Page 302.)

In reviewing the evidence of "subsidence on Oahu" he further says: "A former subsidence of this island is apparently indicated by the coral rock, through the depth to which it has been found to extend in artesian borings. In these borings described a depth of seven or eight hundred feet was found for the coral rock and more than one thousand for broken corals, and over seven hundred is reported by Mr. McCandless from a well in the Ewa district, about five miles west of Honolulu. The facts lead to the inference that the subsidence amounted to at least eight hundred feet, and that it corresponds to the coral reef subsidence which Darwin's theory requires. Mr. McCandless informs me that fragments of coral like those of modern reefs were brought up from various levels.

"The evidence of subsidence to the amount stated is not however complete. Doubt remains because the corals brought up in fragments have not been examined by anyone competent to decide on their identity with existing species. * * * * The facts are not sufficient to answer the question as to the species that contributed materials to the calcareous beds. We may hope that study on the island of the specimens brought up in future borings will remove the doubt that remains" (pp. 304-5).

We now turn to Professor Charles H. Hitchcock's valuable paper on the "Geology of Oahu" as published in the bulletin of the Geological Society of America in February, 1900,—the matter appearing in his more recent (1909) volume on "Hawaii and Its Volcanoes." Treating of the geomorphy of the island he observes that:

"The Kaala dome presents phenomena of erosion very similar to that of Koolau but the great excavations have been effected on the west side as evidenced by the valleys of Waianae, Makaha, etc., while the gradual slopes of the Koolau area impinge closely on the latter, and the drainage has been forced westerly. The work accomplished has been on the southwesterly side, whereas the trade winds have blown from the northeast for nine months of the year. Shall we say either that there must have been a greater fall on Kaala in ancient times, or, that the

present precipitation of moisture has been adequate for the results? Such views are common, and had been expressed in the first draft of this paper. It was recalled that the wind blew from the west on our own visit to that region; also that erosion is effected more by sudden downpours than by ordinary rains, and that consequently the existing fall is sufficiently adequate. Opposed to this is the general aridity of the Waianae region as contrasted with the abundant verdure of Kaneohe Bay. Reflection has suggested a better view. The Kaala dome existed before the Koolau mountains were raised very much above sea level. The ocean came perhaps half way across the island, and the trade winds impinged against the basaltic piles, dropping moisture, which excavated the easterly side very completely and then carved out the leeward side, together with the Waianae wind-gap. Two or more lengthy ridges have been mentioned as protruding easterly from Kaala. In later times Koolau came up from the depths and poured over the skeleton ridges on the east side of Kaala, so as to conceal them from view, and there is the plateau with gentle dip covering the interior of the island, the drainage forced to the base of Kaala from Koolau and the later excavation of comparatively small canyons. This view does not force us to believe in the existence of climatic conditions different from those now prevailing and it enables us to interpret what has happened from the varied topography" (pp. 24 and 25).

Professor Hitchcock notes that after writing the above he found a somewhat similar view expressed by Dana in his "Characteristics of Volcanoes" (page 301), where he says: "The fact that the volcano of East Oahu was in full action long after the extinction of the western cone is shown by the encroachment of the eastern lava streams over its base and the burial, in part, of its valleys," the indications are that "the depth of burial by the East Oahu lavas was probably some hundreds of feet."

Speaking of the "Coral Reef" he further says (page 29): "Most of the islands and points about Pearl river consists of this material [coral] as at Ford's Island, Pearl City peninsula, Laulaunui, etc. About Ewa plantation the limestone area is nine miles long and one and one-half miles wide. It skirts the shore and railroad, the whole length of the southwest shore of Oahu." * * *

"Proceeding northerly [from Barber's Point] Professor Alexander reports a ledge of coral seventy-nine feet above the sea at Kahe and 730 feet distant from the water; south of Puu-o Hulu he mentions another ledge fifty-six feet above the sea and a quarter of a mile inland; also on the south side of Lualualei, twenty feet high. At the south end of the ridge called Mailiilii the limestone reaches the height of eighty-one feet; at other localities on this coast I have observed limited areas of the same substance more or less elevated. The plain of Waialua shows many outcrops of the reef." . . . (pp. 29-30.)

In an attempt to outline the "Order of events in the geological history of Oahu," Professor Hitchcock states: "We are now satisfied with the existence of Tertiary deposits antedating the rise of the earliest basaltic land, but will not consider whether there may have been any rising of the ocean floor in connection with the eruptions." In the list of seventeen events enumerated he finds the Waianae range to figure prominently in at least eleven as follows:

"1. At the base of Kaala igneous eruptions commenced under water to accumulate sheets of basalt until finally the island of Kaala, a smooth dome, rose above the waters, which slowly became covered by vegetation derived from distant regions.

"2. This dome became extensively channelled by streams produced as now by condensation of the moisture brought by the northeast trade winds. Like existing islands under the same conditions the erosion was greater on the northeastern than southwestern sides.

"3. The island of Koolau came up quite near Kaala in a similar manner, and lava flowed down so as to conceal several hundred feet altitude of the northeast flank of Kaala.

"4. Coralline and molluscan limestone commenced to grow as soon as the reef-building animals could migrate hither. Doubtless the work began in the first period and has continued ever since coeval with the other phases of growth. If we were to judge of age from the amount of work accomplished we should say the earlier stages of growth correspond to the work done elsewhere in the later Tertiary. The slow up-building of the volcanic domes and their subsequent erosion required an immensely long period for their accomplishment. The island

was also a thousand feet higher than at present if the Darwinian theory of coral reefs is true.

"6. Some of the dikes both in the Kaala and Koolau areas may have filled fissures at this time.

"8. . . . the formation of Kakakilo and Kapuai of the Laeloa craters.

"11. Decay of the surface of the tuff and, of course, of all the other rocks so as to produce soils.

"13. Numerous eruptions of basalt and formation of most of the Laeloa craters—i. e. Kuua Palailai and Kapuai.

"14. Dikes cutting Kaena Point.

"16. Depression of the whole island mass.

"17. Elevation to the present level. Accumulation of Dunes" (pp. 56-57).

In "Notes on the Tertiary Geology of Oahu" by Dr. W. H. Dall, which appeared for the first time as an appendix to the paper under review, that distinguished scientist reports on observations made by him during a visit to Honolulu in 1899. After an examination of the fossils found in the raised coral reefs at Diamond Head and Pearl Harbor, he sums up by saying: "It is concluded that the reef rock of Pearl Harbor and Diamond Head limestones are of late Tertiary age, which may correspond to the Pliocene of west American shores, or even somewhat earlier, and in the localities studied there was no evidence of any Pleistocene elevated reefs whatever. It is probable that Oahu was a land inhabited by animals as early as the Eocene." (p. 60.)

In a brief paper entitled: "Notes on the Geology of the Hawaiian Islands" published in the American Journal of Science, October 1903, (pp. 301-316) Dr. J. C. Branner deals with a number of special features of geologic interest, among them the formation of Pearl Harbor, but did not apparently visit the Waianae region. Speaking of evidence of depression in the group he has this to say: "Aside from the form of Pearl Harbor there is evidence of depression of Oahu and the other islands of the group. The evidence of depression on Oahu consists partly of the great depths at which coral rock has been found in deep wells; some of the evidence on Hawaii has been

mentioned in the preceding note upon the Waipio and other canyons" (page 305).

I have pleasure in furnishing herewith an unpublished letter of Dr. S. E. Bishop, of January 18, 1905, to Mr. S. A. Deel, then in charge of the U. S. Magnet Observatory at Ewa, Oahu, which supplements his paper on the "Geology of Oahu" in the HAWAIIAN ANNUAL of 1901, as it sets forth his views with reference to the Waianae region in a concrete manner. The letter is as follows:

"Your letter is before me asking 'for information concerning the coral plain forming the southwestern part of this island.'

"I cannot claim much knowledge of the science of geology, but many facts peculiar to the structure of the rocks, mountains and shores of these islands have engaged my attention.

"I will try to state such information as I possess in respect to 'the depth of the coral, its method of formation and elevation, probable age,' etc. Also I will state the theory of the subject as it has taken shape in my own mind, very probably not materially differing from that of others.

"The Island of Oahu is composed of two separate masses of volcanic mountains, the eastern or Konahuanui, or Koolau mountains, slightly encroaching on its older sister, the Waianae mountain, at the southern extremity of which stands your Observatory. Both mountains are of great antiquity, evidenced by the enormous erosion or weathering which they have undergone. This slow gnawing away by the rainstorms has largely obliterated the original dome-form of these piles of lava-flows whose strata lie exposed in the numerous deep ravines. The only remaining traces of the original dome-surface are the short slopes of the foothills which survive on the west side of the Koolau range, and a very little on the southeast flank of the Waianae mountain. What remains of both mountains are the skeleton ridges and pinnacles. Waianae, being much the older, has suffered much the greatest change.

"Besides that form of change, the whole island, probably from a very early period, has experienced great subsidence of level beneath the ocean. This subsidence has been doubtless more than 1500 feet. The evidence of this is the depth at which coral has been found in artesian borings, coral not being possible of growth at more than perhaps twenty fathoms of depth. Also the vesicular structure of the lava found at all depths reached by the borings proves the original position of those lavas to have been above sea level, since the pressure below that level would have prevented the occluded gases of the magma from expanding.

"At an extremely recent period the whole Island of Oahu underwent an apparently simultaneous elevation of level, amounting to from thirty to fifty feet, those being the altitudes at which formerly submarine formations are now found in position above sea-level. Among such elevated calcareous formations of greatest altitude are,—

coral reef on back of Pauoa stream a little below School street bridge in the city; reefs in Waianae near the railway adjacent to high lava promontories, and at the north end of the island, a number of masses of ancient *sand dunes* which had been submerged and cemented into hard sandstone by marine action, but were later elevated, and now indicated that marine actions, to a present height of fifty feet.

"As to the depth of the coral in your locality, I would suggest an approximate estimate as follows: I find by the latest map of Oahu that Barber's Point lighthouse, near which I believe is the Observatory, is about $3\frac{1}{2}$ miles from the nearest point of the base of the mountain where it meets the plain. Also from that base to the nearest peak is but a slightly greater distance. I think it safe to assume that the grade of descent was the same from the same present base of the mountain to the bottom of the coral reef at the Point. The present altitude of that peak "Manawahua" is given on the map as 2,450. It has doubtless suffered much degradation by weathering. It seems therefore quite safe to estimate the depth of the coral at Barber's Point at 2,500 feet.

"As to the method of formation of coral reefs, that is very fully and well treated in many books on the subject. A coral reef seems to be an accumulation of the debris of various corals and shells beaten by the heavy surf to powder, and cemented by the sea-water. A gradual accretion grows up as the land subsides beneath it, forming first a 'fringing' reef, and later, if fresh water from the land interferes with marine growth at the shore, forming a 'barrier' reef. There being little fresh water from the adjacent mountain, only a fringing reef was formed at Barber's Point, miles in width and of great solidity.

"The formation of such reefs on the western shore along Waianae seems to have been prevented by the violence of the westerly gales, from which was well sheltered the bay between the Waianae and Koolau mountains.

"Of the cause of subsidence of volcanic islands, which seems to be very general in their history, I know of no theory except that their weight tends gradually to press down the earth's crust.

"How Oahu came later to undergo a slight elevation, seems to me attributable to some influence of a widespread disturbance of equilibrium of land and sea attendant upon the retiring of the ice-cap at the close of the last glacial period. Such disturbance is farther indicated by the brief explosions about the same date of the series of tuff cones along the southern coast of Oahu, including Salt Lake, Diamond Head, Koko crater, and others. Artesian borings establish the fact that Punchbowl was thrown up before the elevation of the reef, and the rain of black sand (volcanic ashes) covering Honolulu, after that elevation. Quite certainly Diamond Head came after the reef was elevated.

"I should tentatively guess the age of that elevation to have been 12,000 or 15,000 years ago.

"Dr. Dall of Washington, observing the shells found in the ancient coral of our reefs, assigned them to the later Tertiary.

"I should guess the age of our Koolau range to be much beyond one million years, and Waianae to be 50 per cent. older. The coral reef may have begun to accumulate before the lavas ceased to flow,

although much of it must be later than the extinction of the volcanic activity.

"This sketch of the subject has perhaps unduly extended itself. Thanking you for calling forth the enjoyment experienced in writing it, I remain,

"Most sincerely yours,

"(Signed) SERENO E. BISHOP."

After a careful and exhaustive study of the whole terrestrial molluscan fauna of the Hawaiian group Dr. Henry A. Pilsbry, in the introduction to the *Achatinellidae*, in volume 21 of the Manual of Conchology, sets forth his view of the origin, dispersal, and development of this interesting group of land mollusks, dealing at length with the geologic and topographic data bearing on the evolution of this division of the Hawaiian fauna. As it is the most recent, and as no more illuminating treatment of the vexed subject of the dispersal of the fauna of these islands has yet appeared in print, I venture to quote at length such portions of his "Introduction" as bear on the subject of this paper:

"The Hawaiian Islands are, as is well known, volcanic masses standing upon the southeastern end of a submarine ridge, over 1,700 miles in length, stretching from Ocean and Midway Islands to Hawaii and rising from a depth of about 3,000 fathoms. The present islands being wholly volcanic, so far as known, many geologists have assumed that the entire ridge has been built up of volcanic materials. This inference is unsupported by evidence. The Andean ridge is not wholly volcanic because it is crowned by great volcanoes. It is quite possible that the Midway-Hawaiian ridge is a product of diastrophism which preceded the volcanic period. However this may be, the richness and peculiarity of the fauna and flora, and the belief that the volcanic islands as they now stand are probably of no great age, has led to the hypothesis that formerly a much greater land area existed, now lost by subsidence. So conservative a zoogeographer as Wallace considers this probable; and except for an advocate of special creation the theory of a land area, antecedent to the present volcanic islands seems necessary to account for the faunal characteristics. That there has been a progressive deepening or sinking of the floor in the great ocean basins is a view now generally held which, if well founded, accounts for the general subsidence of the Hawaiian ridge.

"The absence of drowned valleys and fjords as well as great sea cliffs where the waves have gnawed deep into the peripheral

volcanic deposits speaks against recent subsidence. There is evidence of slight elevation in some places; but the islands seem to have remained practically stationary since the cessation of volcanic activity in the older masses. Geologists are chary of expressing an opinion of the age of the volcanic masses, in the absence of palaeontological evidence. Those best acquainted with aqueous erosion as displayed in the Grand Canyon, etc., hold the opinion that the furrowing of the older Hawaiian volcanoes may readily have been accomplished in Neocene time, and possibly since the beginning of the Pliocene.

"In this stationary period of the islands, during which the present complex topography has been developed from simple unfurrowed slopes, the specific and varietal evolution of the *Achatinellidae* seems largely to have taken place. The topographic features more or less closely coincide with or define the ranges of species and varieties. The development of topography and the evolution of species and varieties evidently precede *pari passu*. In former times, before the slopes became so rugged and the contrasts of ridges and valley conditions so emphatic, species doubtless spread much more freely than they do under present conditions. Thus in Hawaii, *Amastra flavescens* has spread from Hamakua district down to the southeastern slope of Mauna Loa. With subsequent isolation the more plastic of these widely spread forms have evolved into chains of allied species or races. Precisely similar phenomena have been recorded by the author from the mountain chains of southern Arizona, where the bed of the canyon may separate distinet but related species.

"Dana was the first to show that Hawaiian volcanoes are progressively newer toward the southeast. Dutton qualified this generalization: in the northwest they became inactive long ago, and have therefore been sculptured by erosive activities for a longer time. In fact, Kauai and Oahu, West Maui and northwestern Hawaii are long extinct volcanic masses, Eastern Oahu and East Maui newer, and the rest of Hawaii still building. So far as is known, the Kohala region in Hawaii may be as old as Kauai.

"Dana's generalization, which is thus subject to considerable qualification, was doubtless the basis for Professor Hyatt's hypothesis that the snails migrated from island to island, from Kauai southward. A considerable acquaintance with land shells causes me to doubt whether snails of moderate or large size have

often been spread by the accidental means invoked to explain inter-island distribution, though we have the strongest evidence that small or minute land snails have spread probably by hurricanes, over considerable distances. The actual facts of the distribution of Hawaiian Island snails do not indicate, to my mind, a migration from Kauai.

"The logical geographic boundaries of most species of *Achatinellidae* give excellent ground for the belief that the present distribution of all the larger species has been attained by their own means of locomotion, and that unusual or so-called accidental carriage, as by birds, drifting trees, etc., has been so rare as to be negligible. No evidence whatever of such carriage is known to me. . . . In the Hawaiian Islands the *Achatinellidae* inhabit mountain forests; there are no rivers to transport trees carrying snails to sea. Even if so transported the chance is almost infinitely remote that if cast upon another island the conditions on the shore would be favorable for such snails. If the transportation of arboreal *Achatinellidae* by such means is improbable, that of the large terrestrial forms is even more difficult. It is hardly worth while alluding to the possibility of these snails being transported by birds, since everybody having practical knowledge of land snails understands the absurdity of such a proposition. . . .

"If we have no logical ground for the belief that the viviparous *Achatinellidae* have been spread over sea from island to island by such means as we have just considered, how has their spread been effected? Only by the traveling of the snails themselves over land and through forests now submerged. No other hypothesis is adequate to explain the facts of distribution, and the mutual affinities of the several island faunas." (pp. xii-xv.)

From his studies of the affinities and geographic relations of the several groups of land snails Dr. Pilsbry has been led to "infer the following sequence of events probably beginning in Mesozoic, possibly in Eocene time:

"I. The Hawaiian area, from northern Hawaii to and probably far beyond Kauai, formed one large island which was inhabited by the primitive *Amastrinæ*, ancestral forms of *Leptachatina Amastrella* and *Cyclamastra*. This pan-Hawaiian land, whatever its structure, preceded the era of vulcanism which

gave their present topography to the islands and probably dated from the Palaeozoic.

"II. Volcanic activity built up the older masses, subsidence following, Kauai being the first island dismembered from the Pan-Hawaiian area. . . .

"III. Northern Hawaii was next isolated by formation of the Alanuihaha Channel, leaving a large intermediate island, which included the present islands of Oahu, Molokai, Lanai and Maui.

"IV. In the eastern end of this Oahu-Maui island *Laminnella* arose from Amastroid, and in the west *Pterodiscus* was evolved from *Cyclamastra* stock.

"V. The Oahuan and the Molokai-Lanai, Mauian areas were sundered by subsidence of the Kaiwi Channel: (a) In Oahu there were two centers, probably two islands, a western or Waianae, and an eastern or Koolau area. In the Waianae center *Paramastra*, *Planamastra*, and *Armsia* were differentiated, while *Metamastra* arose from *Amastrella* in the Koolau area where arboreal *Achalinellidae* chiefly flourished. In the late Pliocene or Pleistocene time a forested connection was established between the two Oahuan evolution-centers. This transitory connection allowed some intermingling of the two faunas; but while the land connection endured to the present time, the forest became extinct, again isolating the two centers so far as arboreal or forest snails are concerned. (b) That the eastern or Molokai-Lanai-Maui region formed a single large island up to late Pliocene or even to Pleistocene time is evident from the very close relationship of the faunas of those islands. In view of the intense local differentiation everywhere observed in the Hawaiian group, we could hardly expect closer relations between the species of these three islands if they were still united. . . . Probably all [of the chief groups of this area] had been differentiated before the separation from Oahu though part of them never spread apparently, so far as that island. The formation of the channels between Molokai, Lanai and Maui must be considered very recent. These islands stand on a common platform within the 100-fathom line." (pp. xvii-xix.)

If we review in chronological sequence the evidence of the deep subsidence of the Waianae range presented in the writings of those who have studied the geology of the Hawaiian group—having in mind that other writers who could be cited have ex-

pressed similar beliefs, or at least concurred in the opinions expressed by their contemporaries—it will appear that for seventy-five years there has been forming in the minds of the naturalists who have labored over Hawaii's geology and topography, as well as those who have studied its fauna and flora, a belief in a noteworthy subsidence of at least a portion of the group.

Let us glance at the main facts as they have developed. Dana first noted the progress of volcanic activity in the group from Kauai towards Hawaii. He was first to pronounce Oahu the joint product of two important centers of eruption. While unable to fix the center of Waianae activity, he noted the great erosive dissection of that range, and called attention to the impingement of the Koolau lavas on its eastern flank, thereby concluding that the western was the older of the two masses. He studied the elevated reef in various places about the island of Oahu and notes its height as from ten to twenty-five feet above the sea. He was much impressed by the area of the ancient reef, stating it to be equal to that of the growing reef that surrounds the island. He hazards no opinion as to when it was elevated, nor does he appear to have given any study to its fossil content on the occasion of his first visit.

Dr. Brigham, in the account of his visit in 1864-5, observed that the appearance of the barren district of Waianae "was that of a vast crater broken down toward the sea". He evidently did not consider the appearance of the region as suggesting the origin of the mountains that surrounded it, however, for in another connection he remarks that the lavas of Oahu issued from two centers "but the vents were not clustered around two points, thus forming a symmetrical peak, but are arranged in two lines parallel to the general trend of the group; resulting in two mountain chains." The elevated reef about the island, coupled with other observations, led him to speculate on the topographic appearance of Oahu and the work that would have been done by the sea at the time when the ancient reefs were submerged. He placed the total submergence at that time at from one hundred to one hundred and seventy-five feet but concluded in another connection that Oahu had been elevated nearly two hundred feet.

In 1891, after farther study, Dana finds no data for estimating the original dimensions of the mountains of West Oahu, but is struck by the elevation of the several peaks of the range as well as by the deep open valleys divided off by sharp ridges, and feels that they are sufficient evidence that the mountain range is but a small remnant of the once great volcanic mountain, but concludes "whether great loss has resulted from subsidence is not ascertained."

Between the time of his first and later visits a number of artesian wells had been driven on Oahu; some of them going down for 1,500 feet. From the log of these wells, it was apparent to Dana, and to all, that they furnished evidence, of a sort, of a number of periods of subsidence amounting in all to at least 800 feet. It will be seen from a reading of his "Characteristics of Volcanoes" that Dana was the first to urge the evidence of deep submergence and to pave the way for a general belief, among scientific workers interested in the islands, in the deep and substantial subsidence of the Island of Oahu. The five or six hundred wells that have been put down, from first to last, in the so-called "artesian belt" on Oahu, has added much evidence pointing to subsidence that to the layman, at least, has amounted to positive proof.

Unfortunately, however, the materials brought up from the borings are in the nature of a soupy emulsion of lavas, mud and calcareous deposits, formed from the various strata encountered, all ground to powder by the heavy drills before it is mixed with water to be pumped out. Seldom indeed is a piece the size of a walnut to be secured at the mouth of the borings, and when such specimens are brought up the depth of their origin is always in doubt since they are far more liable to have been knocked lose from the wall of the well, as the long tubular bucket is hauled, than to have come up from the bottom of the bore.

There is, therefore, nothing in the appearance of the calcareous samples obtained at the mouth of the well that will prove them formed of coral in place and not composed of coral mud or sea sand—substances that might be carried by the sea from any convenient source and dropped on the slopes of the sub-

merged portion of the mountain, there to be covered over, from time to time, with other layers of mud or lava as the mountain grew by eruptions, either beneath the sea or from the summit, or by ordinary aggradational processes beneath the level of the sea.

Professor Hitchcock, after weighing the evidence of profound erosion exhibited at Waianae, Makaha and similar valleys, ingeniously explains their presence on the lee side of the island while the opposite slopes are less deeply dissected. He notes that in the Koolau range the greatest erosion is on the opposite side, their windward slopes being astonishingly eroded. He suggests that the Waianae range was far advanced in erosive decay before the Koolau range rose to sufficient height to capture the rain brought to the island by the northeast trades; concluding from the evidence that both sides of the Waianae range were deeply eroded before the valleys on the east slope were blocked up by flows from the neighboring volcanic range.

He found evidence back of Waialua plantation and about Kaena point that led him to believe that "it seems evident that there must have been a very recent depression of the island to the depth of two hundred and fifty feet, very likely in the Pliocene." Thus Professor Hitchcock seems to be the first geologist to attempt to place the time of this important change of level for the island. As to the origin of the extensive period that resulted in the building up of the original Waianae dome he bases his conclusions partly on his own researches and partly on the published conclusions of Dr. Dall and is "satisfied with the existence of Tertiary deposits antedating the rise of the earliest basaltic lavas." Dr. Dall is possibly even more definite in his conclusions, fixing the existence of land where Oahu stands at the opening of the Tertiary age by saying: "It is probable that Oahu was a land inhabited by animals as early as the Eocene."

While appreciating the obvious reduction of the Waianae during an extensive period of erosion, Dr. Sereno Bishop was even more impressed by their loss of size through subsidence, for he was convinced that "The whole island, probably from a very early period, has experienced very great subsidence of level

beneath the ocean. This subsidence has doubtless been more than 1,500 feet." The recent slight re-elevation of the ancient reef he ingeniously connects with the "widespread disturbance of equilibrium of land and sea upon the retiring of the ice-cap at the close of the last glacial period" (i. e. the Pleistocene), guessing the time that has elapsed since the emergence of the ancient reef to be some 12,000 or 15,000 years. He also tentatively placed the date of the emergence of Waianae at 1,000,000 years.

Dr. Pilsbry imbued with the necessity of providing a land connection from island to island over which the ancestral forms of the living molluscan fauna could disperse from Kauai to Hawaii, suggests that there has been a much deeper subsidence of the Hawaiian plateau in the nature of a progressive subsidence, that has cut off island after island, to be followed at last by slight re-elevation at a comparatively recent period. All biologic facts so far gathered in the study of the land fauna and flora seem to point to the correctness of this theory. But if we accept Dr. Pilsbry's view we must have in mind the depth of the inter-island channels and be prepared to account for more than 18,000 feet of subsidence for the island mass of Oahu.

Dr. W. M. Davis, the eminent American physiographer, on his recent visit to the Pacific to study coral reefs and the geologic problems connected with their formation, was much impressed by the definite physiographic evidence of subsidence to be seen on every hand on Oahu. It was due to his stimulating interest that this paper was prepared and at his request submitted to him for consideration in connection with the larger problems, connected with the formation of coral reefs and atols, that he has now in hand.

From the above it will appear that the development of the hypothesis that the islands have been severed, one from the other by subsidence and submergence, has progressed slowly and that the underlying data has accumulated gradually. As an example of the evolution of a scientific theory the history of the case is in itself most interesting. It has advanced and been elaborated and generally accepted step by step from a simple statement of the more obvious facts to a fairly complex hypothesis as the

available data has been collected, studied and interpreted, until today the one thing most lacking seems to be something in the nature of visible and positive proof of a definite and uncontrollable nature,—a form of proof, unfortunately, rarely met with in geological speculation. However, a near approach to proof of this nature is to be found in an especially convincing form in the vicinity of Waianae village, where correlated facts are written in a sequence of topographic characters that apparently can have been produced in one way and so far as is known in one way only.

It will be seen by reference to the recent contour map of Oahu, that on the section of the Waianae range as shown, the region from Kaena Point on the northwest to Nanakuli valley presents many of the usual features of a large volcanic mountain mass that is deeply dissected and has advanced far in all forms of subaerial erosion. From the highest point (Kaala) there radiates in all directions a series of long, narrow, saw-toothed ridges. The ill-defined backbone of the mass, generally spoken of as the backbone of the range, extends in an irregular curved line from Kaena Point through Kala (4,030) and the intermediate peaks and passes (Kulena, 3,507 feet; Kumakalii, 2,914; Kolekole Pass, 1,590; Hapapa, 2,878; Kanehoa, 2,720; Puu Kana, 3,105; Pohakea Pass, 1,870; Palikea, 3,110; Mauna Kapu, 2,740; Maunawahua, 2,450) down to the sea at a point designated at Brown's Camp.

Outliers mostly in the form of sharp-edged, saw-toothed ridges extend from this central line in all directions, but chiefly from its eastern and western sides. Along the sides of these outliers as well as in the heart of the mountain the solid, massive lava lies exposed, showing the edge of flow-sheets of various thicknesses. It is evident to the most casual observer that they were laid down as successive sheets of more or less dense lava that, after flowing rapidly out from the source in the core of the ranges, solidified as they cooled.

The dip of these sheets as evidenced by the flow lines, on the sides and at the heads of the valleys, radiate from a common center, which—as shall be pointed out in a separate paper on the source of the eruptive lava of the Waianae range—doubtless

lies at the foot of the Kolekole and Pohakea passes. The depth and width of these valleys, cut as they are in a solid pile of basalt, is convincing evidence of the vast time that has elapsed since the mountain was finished as a volcanic dome, and indicate the vast work in dissecting a mountain that can be accomplished by wind and water in a tropical climate.

Beginning at the locality marked Keawaula, near Kaena Point, and extending to Nanakuli valley, the floors, as well as the sides of the several intervening valleys, are most interesting and instructive. They are all shown to be broad valleys receiving many smaller, steeper branching valleys and ravines that dissect the mountain mass at their head and on either side and are the unmistakable result of stream action. Makaha, Waianae, Nanakuli and the broad plain of Lualualei have advanced far toward accomplishing their ultimate work as valleys—that of base-leveling the mountain mass. The long, comparatively low outlier between Waianae and Lualualei is in reality a remnant ridge which is cut through at a point a third of the way from its head by the right arm of the Waianae stream. It is an excellent example of the final destiny of the sharp, narrow dividing ridges, so common on Oahu, since it is as far advanced towards its final removal as any mountain ridge to be found in the islands.

Indeed the evidence is everywhere plain that not only have these deep valleys been worn out, but that the tops of the dividing ridges have been worn down—hundreds, and in places thousands, of feet—during the time that the Waianae have stood exposed to the erosive force of the elements. By a little study of the sides of the valleys in the lower levels where the erosion has been less rapid, thereby leaving the remains of old flows as caps on the foothills, it is evident that the summit of the ridges, even the summits of the highest peaks, as well as the very valleys themselves, must have had a much higher covering than now exists, and that what remains is but the remnant of what formerly was there. If we take the angle from the horizontal exhibited by the flow lines on the lower slopes at Kaena Point, at Nanakuli, and on the easterly side of the main range of peaks at Puu Kuua and other similarly favored localities, and project them towards the probable source of eruption, it is easy to estab-

lish that the mountains have been worn down not less than 3,000 feet from the original surface over the whole of the central portion of the range where the rainfall has been most abundant. It is obvious, then, that since the last great eruption, that gave the final form to the volcanic cone of which only the remnant remains, a vast time has elapsed. The mountain rains must have first cut narrow valleys across its new surface that in time supplied steep, straight courses by which the copious rains could reach the sea—only a few miles distant. Then many branching valleys must have been worked out among the irregularities of the surface. Finally the valleys became broader by the wasting of their sides and deeper from the scouring of their bottoms. Things being equal the streams which carried the most water at the beginning were able to advance with the work of erosion and transportation most rapidly so that the valleys with the living streams today have in all probability always had a large share of the rain that fell on the mountain slopes. It is not strange then that Waianae and Lualualei have advanced farther with their work than the drier valleys of Makua and Nanakuli. Nevertheless, these valleys are all deeply cut and present fine examples of valleys developed by normal erosion, carved out of a pile of lava formed of successive sheets. That they are not formed as the result of faults, or ruptures of the mountain, is shown by the horizontal flow lines exposed in the truncated ends of the outliers where their tips have been removed by the sea. This point can be plainly made out from the appearance of the horizontal and undisturbed sheet-lines shown on the ridges between Makua and Keaau, Keaau and Makaha, at Mailiilii, Punohulu and at a number of other places along the coast.

Having accounted for the normal valleys of the section it remains to explain the origin of the isolated mountains of the coast region of the Lualualei basin or plain. The evidence necessary to account for their appearance and disposition is not far to seek. If the flow structure of Mailiilii and Punohulu is examined it is apparent that they are isolated remnants left as parts of the original mass of the great mountain of Waianae. The sheets have the same dip and character as the sheets in the lower portion of the nearby outlying ridges as Puu Paheehee

and Puu Haleakala. The gap between them and these adjacent ridges is precisely similar to that now existing as a water gap for the right arm of the Waianae stream between the points of Mauna Kuwale and Kauao Puu. On the ground it is not difficult to see that Mailiilii, for example, is but a branching continuation of the long, low-lying ridge that terminates back of the village of Waianae, and that it is not the remains of an isolated crater, as is commonly supposed.

Turning to consider the floors of the valleys of the Waianae district, the striking feature is that they are broad and flat towards the lower end in each case and that the upper portion rises gradually, sometimes rapidly, to the head. The upper portion is a rocky slope, while the lower ends are floored up in most cases with an elevated reef. Between Mailiilii and Puu Paheehee, for example, this old reef is set well back within the eroded lava outliers. Except near the middle where a shallow stream-channel is cut over its surface the reef in this old embayment is approximately eighty feet above the sea.

Examination of any typical valley formed in the lava mass shows that the tendency is to form the usual V-shaped valley and that the slopes of the sides usually stand at an average of about forty-five degrees from the stream to the summit of the ridge on either hand, whatever the depth of the valley may be, so long as the bed of the main stream does not approach too near its base level. As the bed of the main stream approaches base level, however, it tends to wander from side to side and to flatten and widen the floor of the valley. The short valleys of Keawaula and Keau continue as V-shaped valleys down to the point where they are floored up by the ancient reef. It is reasonable to conclude that the valley between Mailiilii and the neighboring ridge is the head end of a valley that has been cut through in some such manner as is shown by the Waianae water gap, but the severing must have occurred before it was submerged, and the conditions made favorable for the disposition of the coral deposits that completely surround this point of volcanic rock on the 60-80 foot contour.

Here, then, near the present shore-line is evidence that conditions existed before subsidence similar to those to be found

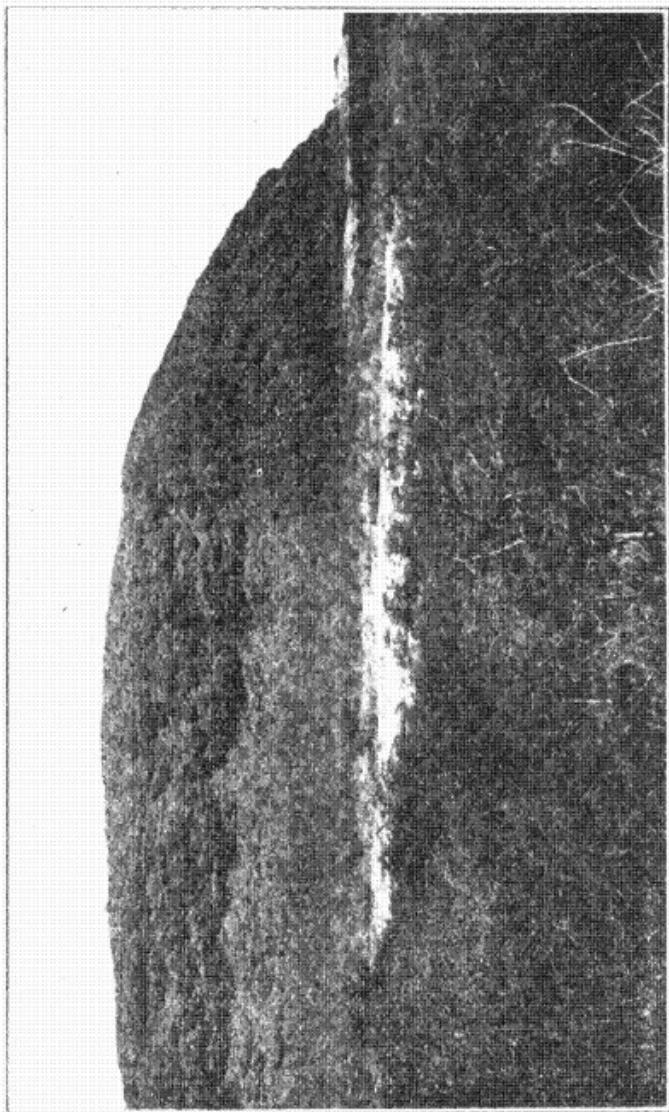


PLATE I.—SEAWARD END OF PU'U MAIAMI SHOWING THE 60-80 REEF
IN THE FORE GROUND. THE U. S. ARMY QUARRY IS AT THE EXTREME RIGHT.

farther inland, i. e., near the heart of the mountain and near the head of the adjacent stream, that has cut through the dividing ridge at a much higher level. It seems clear the Maililili is the inshore remnant end of a ridge similar to Paheehee that has disappeared beneath the sea. If we conclude that the valley between the above-named points developed as a normal valley before it was cut through at the head, there is then clear evidence that there must have been very deep subsidence of the region, since the sides of the valley were far removed from each other by erosion before the reef was formed between them. The center points on top of the outer ends of these two adjacent outliers is shown on the recent map as being just under a mile apart. If the normal slopes of each point were projected towards each other until they met at the center of the submerged valley, the point would be in the neighborhood of 2,500 feet below the surface of the upraised reef.

The only way in which it could be positively proven that the valley was worked out at this point to that depth before it was submerged, would be to sink a well down in the middle of the valley until the solid rock floor was encountered. This, unfortunately, has not been done. However, a number of artesian wells have been driven at several points in the Waianae district that furnish much interesting data, all tending to sustain the belief in the deep subsidence of the valleys in that region after they had been eroded out of the mountain mass when it was standing at a much higher level.

Of the twenty-eight wells driven by the Waianae plantation, the data for which has been kindly supplied me by Mr. Meyer, the manager, all but three have been drilled at the mouth of Waianae valley. Twenty-one of these wells are a few feet above sea level, grouped in a cluster about the pumping station, situated at the seaward slope of Kamaileuna, which is the ridge dividing Waianae from Makaha valley. These wells are from 260 to 300 feet in depth and furnish a comparatively small supply of fresh water. In drilling the first seventy-five feet, soft earth and boulders were encountered; the rest of the bore was in solid lava rock. The depth at which the solid rock was encountered indicated plainly that the rock was but the continua-

tion below the surface of the seaward slope of the ridge above.

The second locality is well within the valley, at a point near the southeast slope of Kamaileuna, 7,000 feet distant in a direct line from the mill. It is 850 feet deep and furnished no water. The log shows "soft earth and boulders for the first thirty feet, then twenty feet of coral rock, followed by 800 feet of river bed sand and gravel."

Three wells which yielded no water were driven a short distance from each other 4,000 feet back of the mill near the middle and southerly part of the valley floor. They are 175, 200, and 300 feet deep respectively. Loose earth and boulders were passed through for the first seventy-five feet; the rest of the distance was made up of "river bed gravel and sand."

It seems but one deduction can be made from the data furnished by these wells and that is that the valley of Waianae was scoured out at one time for more (we do not know how much more) than 800 feet below its present broad level. The cutting out of the valley floor could only be done when the Waianae stood much higher than now. The proof that all this work of scouring out the deep valley and refilling it with rounded boulders and sand was done before the present uplift is shown by the coral rock laid upon the surface of the hill and by the old shore-line on the 40-60 foot elevation. This reef rock and shore-line is plainly shown bordering either side of the broad valley, and is well within the embayment formed by the outpost ridges. Moreover, it is shouldered on the eroded surfaces of the ridges on the opposite sides of this valley, which is almost two miles across at the old shore line.

The three remaining wells were driven in the Lualualei basin. The first of these, situated 10,000 feet almost due east of the mill, between the mountain end of Mailiili and the present pump, was driven 800 feet. Soft earth and boulders were passed through for sixty feet; the remainder of the depth was through "river bed gravel and sand". The second well in this basin was near the geographical center of the valley, 17,000 feet in an easterly direction from the mill. It was 1,200 feet deep; the first 300 feet penetrated soft earth, the remaining 900 in "river bed gravel and sand." The third well was at the foot

of Puu Kaua, 25,000 feet distant from the mill in a direct line. It was drilled for the 300 feet of its depth in "solid lava rock." None of the wells in the Lualualei region furnished fresh artesian water.

Either the great circle basin at the head of Lualualei was a hollow basin hundreds of feet deep standing below the sea level when the mountains about it were finished, or else it formed a normal caldera above sea-level that has given way on the seaward side and since deeply subsided together with the whole mountain mass. The probabilities seem to point strongly to the latter alternative. At any rate, this region has been filled for hundreds of feet with silt and other fine products of the decay of the adjacent slopes.

When we remember that the circular area at the head of Lualualei is from three to four miles in diameter some appreciation of the time that must have elapsed before the submerged basin was filled to its present level with the results of volcanic rock decay can be arrived at. One can but conclude that it must have been hundreds of thousands of years. Since the lower or seaward half of the Lualualei area is capped with coral reef mixed with calcareous silt up to and above the 80-foot contour line, it appears that the great bulk of the earth and "river bed sand and gravel" must have been in place before the reef was formed, and hence before the time of the uplift of the reef exposed about Mailiilii. This is farther supported by the fact that comparatively little rock waste, in the form of talus, lies on the surface of these uplifted reefs at the various places where they are shouldered onto the old eroded slopes of the ridges between the Waianae valleys. Such talus material, as lies on top of the uplifted reefs, shows no recognizable sign of having been rounded by the shore action of the waves, as there are no rounded boulders or water-worn debris beds to be found mixed with the angular blocks of lava, from the cliffs, that make up the talus.

By comparing the relatively small amount of rock waste on top of the uplifted reefs, about the old shore-lines, with the vast amount that must have been loosened, disintegrated and transported from out the valleys by wind and water before the

valleys were submerged and made ready to receive the now uplifted reef, we get a rough measure of time that aids in an appreciation of the enormous age of the mountain mass in which these valleys have been formed.

Fortunately, conditions similar to those at Mailiilii are to be found in the old embayment at the mouth of all the large valleys along the western shore of the Waianae range. As a consequence a duplication of evidence of deep subsidence is at hand that is both striking and convincing, once the topographic sequence involved has been worked out and appreciated.

Unfortunately, comparatively few soundings have been taken off the Waianae coast; but, happily, the few that are available coincide with the shore evidence of deep subsidence and seem to clearly indicate that the land valleys extend, as *valleys*, well out to sea, and that shore ridges, such as the one at Kaena Point, extend out to sea as *ridges*, thus adding their testimony to the weight of evidence brought forward in support of the main contention of this paper.

As will be seen by the accompanying chart, three miles off Kaena Point, in the direction of Kauai, a depth of sixty-seven fathoms is indicated. More than three times that depth is secured, however, within less than a mile off shore straight out from Makua valley; while three miles off-shore a depth of 651 fathoms is indicated.

A study and comparison of the several altitudes at which reefs have been formed in the Waianae region indicates that these deposits were formed at several, more or less, definite periods of still-stand, and that the elevation of the section was not, therefore, accomplished at once but rather during a series of slight upward thrusts with considerable intervals of time between them. The greatest subsidence shown by the re-elevated reefs is that recorded by the high reef at the southwest end of Mailiilii. There a flat-topped reef, more than a hundred yards in width, with sea-caves and shore work along the outer edge, now stands approximately 120 feet above the present sea-level. On the opposite, or northwesterly side of Mailiilii is the present quarry. Its surface stands at an elevation of approximately eighty feet above the sea. The deposition of the reef and the

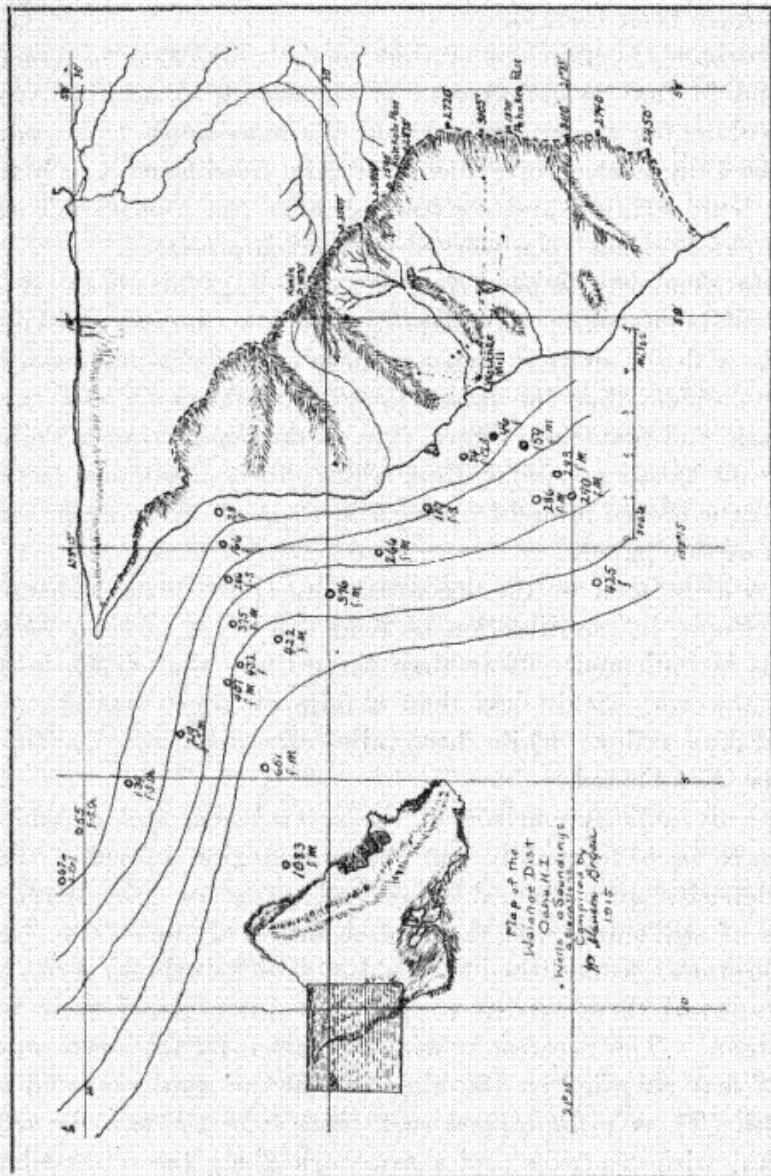


PLATE II. MAP OF THE WAIANAE DISTRICT, SHOWING SOUNDINGS,
ARTESIAN WELLS, ETC.

calcareous mud which encircles Mailiili, filling the valley between it and the adjacent ridges, and flooring up the seaward end of the Lualualei basin to the 80-foot contour, is much more extensive and presumably represents a much longer period of still-stand at this level. Over the plain inland it has suffered much from stream erosion and other causes and is very uneven, remaining in the form of "islands" and irregular patches, suggesting a growth similar to that now met with on the living reef in Kaneohe bay. There the flat top of the coral islands are just underneath the water at low tide. The almost vertical sides of these islands pitch off into water several feet deep, and in certain channels several fathoms deep, where the bottom is covered with loose blocks of coral growth, coral mud and sand.

The 80-foot reef also occurs at Kahe, south of Nanakuli valley, and the old shore line on this level is most pronounced along the coast at Keawaula and at Kaena Point. In this region the horse trail above the railroad follows along the old beach line on the 60-80 foot contour. This beach line is indicated in several places in Makua valley notably by a large number of rounded coral boulders found in lava eaves on this level. Above the reef in many places beyond Makua are unmistakable sand dunes, usually solidified into a loose sandstone. These dunes are usually in narrow gulches and often have their tip ends on the steep mountain slope 350 feet above the present shore-line.

The next important bench is one to be designated as the 40-60 foot reef. It occurs in many places. At Makaha it extends completely across the mouth of this beautiful valley as a rocky floor several hundred feet in width. Its outer or seaward edge has been somewhat rounded down by drainage channels and the bed has been cut out to form the bed of the Makaha stream. The flat between this reef and the sea is now planted to sugar cane; sufficient soil having accumulated, from wash and wind deposits, for the growth of the crop on the surface of the 10-25 foot reef, which forms a level floor between the present and the old shore line.

The 40-60 foot reef also occurs at Makua, Waianae, Lualua-

lei and Nanakuli valleys; at Puuohulu and several other points in the Waianae district.

The most extensive area of elevated reef, however, is the 10-25 foot bench encircling Pearl Harbor. Either as reef or as plainly marked shore line it extends entirely about the island of Oahu. It is this reef that surrounds the curious isolated point, Mauna Lahilahi, off Makaha valley and forms the connection between it and the land. This small elongated island, 234 feet in height, stands west of the railroad as a detached mass of igneous rock. Its formation and origin, as a separate mass of lava, is doubtless very similar to that of Mailiilii. Just as Mailiilii was completely encircled by reef when the island stood submerged up to the 80-foot contour, just so was Mauna Lahilahi surrounded by living reef when the island was submerged up to the 10-25 foot contour. Its position and the level character of its flow structure indicates that it was severed from the ridge Kamaileuna, which is a mile distant inland, by valley erosion with a history similar to that already outlined in the case of Mailiilii.

It is quite evident, therefore, that the flattened surfaces of the several benches of reef indicate a series of low tide levels at which the Waianae mountains, perhaps the whole island, has stood. The arrangement of the five coral benches (including the present living reef) with reference to each other, and with reference to the eroded mountain surfaces to which they are attached, indicates that the highest bench is the oldest, since it was first to emerge, and therefore, the fossils contained within it should be the oldest marine fossils to be found on the islands and should differ most from the fossil-forming animals on the living reef. The high reefs on the 120-foot level have not been opened, but the 60-80 foot quarry at Mailiilii has been most interesting in its fossil content, yielding a number of significant species that seem to bear out this generalization.

In a separate paper, in the course of preparation, it is my intention to go somewhat in detail into the subject of the fossil content of the elevated reefs of Oahu. For a number of years I have been engaged in a study of the animal life to be found on the living reefs about the islands, and have also collected for

comparison an extensive series of the forms found, as fossils, in the adjacent ancient reefs. It should be noted, however, in this connection that several apparently extinct forms of both corals and mollusks have been found that may perhaps well serve as index fossils for the several benches mentioned above, as well as to indicate the association of species in the varying habitats along the coast in former times. For example, the rare extinct oyster (*Ostrea retusa* Sby.) from the so-called Pearl Harbor series has never been taken elsewhere, while several species of shells taken from the 10-25 foot reef at Pearl Harbor are found widespread in localities where that reef is exposed.

On the other hand, from the 80-foot reef at the Maililili quarry I have secured several apparently extinct species, notably an undescribed giant oyster, nine inches in length and weighing $5\frac{1}{2}$ pounds, that have not been met with in any of the other benches examined.

If Dr. Dall and Dr. Pilsbry feel warranted in placing the dune deposits at Diamond Head and the 10-25 foot reefs at Pearl Harbor in the late Tertiary age, probably the Pleiocene or earlier, there would seem ground for assigning an earlier age to the more elevated horizons that by their position and time of emergence, erosion and fossil content, are undoubtedly much older. They probably formed as reefs somewhere near the opening of the Tertiary age, perhaps in the Eocene.

If we accept as reasonable the methods employed in estimating Cænozoic time on the continents, as succinctly set out by Dr. Henry F. Osborn, in his admirable treatise on "The Age of Mammals" we find the dawn of the Eocene placed far back in the world's history. The average of several estimates made by competent authorities,* who have based their calculations and

* Dana (1874) 3,000,000 years. Based on estimated thickness of the total series of stratified rocks and estimated rate of *accumulation* of deposits along present continental shore lines; Wallace (1881) 4,200,000 years. Based partly on *denudation* with estimated thickness of sedimentary rocks and partly on the dates of phases of high eccentricity of the earth's orbit; Walcott (1893) 2,900,000 years. Based on thickness of sedimentary rocks of North America compared with present rate of *accumulation*; Upaham (1893); based on the length of the *glacial stages*, etc.; Knight (1899) 4,000,000 years. Based on the rate of *denudation* or erosion as measured by the amount of exposure of roots of pine trees of known age; Sollas (1900)

conclusions on several methods of computing geologic time, is given by Dr. Osborn, who says "on this basis it would not be out of the way to estimate the age of mammals (Cænozoic Era) at 4,000,000 years". (p. 62.)

If it should be established that the oldest and highest reefs on Oahu are in reality as old as the Eocene, how much older then are the deeply eroded and submerged valley embayments in which they occur? How *very* much older than their deep valleys are the oldest exposed lavas at the core and base of the Waianae mountains themselves!

In conclusion there seems to be sufficient evidence in the physiography of the Waianae mountains, as exhibited by their deeply carved valleys and the ancient elevated reef laid down across their wide valley embayments on eroded lava surfaces, to definitely establish the fact of the very deep subsidence of the mountain mass preceding its slight re-elevation to the present level. This conclusion is farther supported by the logs of the twenty-eight wells, drilled in the Waianae district, and by the soundings available from the ocean floor along the west coast of the range. The foregoing seems sufficient proof of subsidence to make reasonable the farther conclusion that the present range was finished as a dome, which stood at least 3,000 feet higher than the present highest peaks, before the present valleys were routed out, and that the whole mountain mass stood high enough in this early stage to aid in forming, if not to have actually formed, a portion of the land connections between the Waianae mountains and Kauai that is required to account for the dispersal of the Hawaiian land fauna and flora. The age of the range is indicated as several (at least four) times as great as has been heretofore estimated. When considered in connection with the proof of subsidence, herein submitted, the various strata of calcareous material passed through in the sinking of numerous artesian wells on the island of Oahu indicate that the deep submergence of the base of the Waianae range, and of the island as a whole, was doubtless accomplished by a series of depressions, taking place through a long period of time, probably antedating

4,200,000 years. Based on the rate of *accumulation* as against the thickness of sedimentary rocks, etc., etc.

the Eocene and that the re-elevation of the Waianae range to the present level was the result of, at least, four successive periods of emergence, produced by deep-seated causes, with definite and protracted periods of stand-still at the close of each such period.

MORE OF JOHN YOUNG

IN VIEW of the interest and inquiry relative to John Young, companion of Kamehameha, of which an account was given in the ANNUAL for 1911, the following "extract from the Journal of a trip around Hawaii by Rev. Artemas Bishop, in 1825," gives Mr. Young's own version of his landing, detention, and early life in Hawaii, and confirms important points already presented.

"Wed. Dec. 14, '25. Sailed this morning in a double canoe for Kawaihae and arrived at sunset, a distance of 40 miles from Kailua. Spent the evening and night with Mr. Young. This gentleman is nearly 80 years of age and has resided on this island about 40 years. He is an Englishman by birth, but followed the seas for several years out of Philadelphia, was in the confidence of his employers, and expected to be raised soon to the command of a vessel. His last voyage was in a ship trading to the N.W. Coast of America and from thence to Canton. On her return from the N.W. orders had been given to meet her tender, a small schooner, at this island where they were to touch for refreshments. The tender arrived first, and was immediately seized by the natives and the crew all massacred except Isaac Davis. Upon the arrival of the ship the schooner was concealed to avoid detection. After trading with the natives awhile, Mr. Young obtained liberty to go ashore and spend the day in viewing the country. But unexpectedly meeting with Isaac Davis, he learned the fate of the schooner and crew. At night when he sought an opportunity to return on board, he found every canoe prohibited from any further intercourse with the ship. In this distressed condition he had the pain to witness the ship for three days successively to stand close

in shore after him. On the third day she was observed to come nigher than usual, when Mr. Young made every attempt possible to procure the means of returning but in vain. The ship then fired again and standing about set her studding-sails to the breeze, was soon out of sight, and he saw her no more. Young and Davis wandered from place to place for several years dressed in the native habit, until at the suggestion of Capt. Vancouver, Kamehameha gave them land. For Mr. Young's signal service to the king in his wars, he made him a chief, and gave him his niece Kaoanacha in marriage. This woman is still living with him and has a large family of children, most of whom have grown up. The above particulars I have just received from his mouth."

CONGRESSIONAL PARTY'S VISIT

CASTING BREAD UPON THE WATERS.

O PINIONS differ as to the whys and wherefores of the liberal appropriation of public moneys to meet the expenditures for travel and entertainment of an invited congressional party for a pleasurable vacation outing, as has been Hawaii's experience on more than one occasion. But it is one way of overcoming some of the disadvantages Hawaii is and has been laboring under from various causes, based largely upon ignorance of actual local conditions. Sound and thorough educational work is ever classed as a wise expenditure because of its realization possibilities. In like manner Hawaii's effort to have her problems better known to the senators and representatives of congress who have to deal with them is a legitimate educational expense, since the seeing of our problems and how we are endeavoring to meet them is likely to have them better understood and acted upon intelligently. But be that all as it may, they have been here and are gone; a goodly sized company it was, the senatorial party with their wives numbering twenty-six, the representatives with their wives, etc., eighty-eight, and other notables, ten.

The following is a brief account of the itinerary:

Due arrangements were made for the arrival of the distinguished guests by the steamer *Sierra* from San Francisco, May 3d, and their welcome by the reception committee even before landing, with provision of personally conducted private autos to whisk them to their haven of rest, the Moana Hotel, was indicative of the preparedness at all points for a "whirlwind visit", for the most to see and hear during their short stay, without loss of time. The aloha greetings and lei decorations so characteristically Hawaiian, gave them a pleasurable "at home" feeling that overcame the idea of being "strangers in a strange land".

Those so inclined this first day were initiated in the surfing and bathing charms of Waikiki, and in the evening a general reception was given by Governor Pinkham at the Executive building in their honor, followed by a ball at the armory. The second day was given to visiting the principal public and private schools of the city, the auto journey affording the guests the best kind of sightseeing in and around the town. The party was greeted at the Kaiulani school with the flag salute and singing by its 1,230 pupils, augmented by those of Kauluwela and Pohukaina schools. The Ad Club luncheon divided this educational tour of the day and gave an occasion for expression of some impressions, while the Mayor's luau in the evening at Kapiolani Park was a novel feast—a la Hawaii—at which a number of addresses were made.

The next day was devoted to military matters by a visit to Pearl Harbor for navy yard inspection, and Leilehua where a parade and review of 5,000 troops stationed at Schofield Barracks did them honor. A chowder supper at the Outrigger Club, Waikiki, was the evening attraction ere departure for Maui by the Mauna Kea at 10 p. m.

Landing at Kahului, two days were spent on Maui, visiting Wailuku, Paia, Haiku, Puunene and other points of interest, then to Lahaina to take steamer for Hawaii toward midnight. A reception and dance was given at Puunene, and a morning reception at the Wailuku court house, which occasion commemorated ex-Speaker Cannon's seventy-ninth birthday, the event being remembered by the presentation of a gold-mounted cigar

case on behalf of the people by Mrs. Kepoikai. The attractions of Lahaina lured the party for the afternoon, winding up with a bounteous banquet under its famous banyan tree, its branches made brilliant with vari-colored electric lights.

Four days were devoted to the big island, the party landing at Kealakekua where they were taken in hand by Hawaii's reception committee, and entertained by its historic and natural attractions of the vicinity ere taking autos for an over-country ride to Hilo by way of the volcano, a trip that gave much delight by its varied scenery and character of country. Kilauea, ever fitful, always impressive, lured many from resting on arrival at the Volcano House, for an immediate visit to the pit, notwithstanding their ninety-mile ride. Night visits were also made and the grandeur of Pele's varying moods indelibly impressed the visitors. Thence to Hilo, where a round of activities engaged their attention in sightseeing along the coast by special train to Hamakua, with more "educational impressions", en route, by the school children at Honomu. A public meeting at Hilo in the evening was an occasion of interchange of views anent federal public improvements and other projects affecting Hilo's welfare in particular and Hawaii in general. On Tuesday the cornerstone of the federal building was placed, Representatives Cannon and Burnett taking part in the ceremonies, after which a garden party was given in their honor at the Seaside Club, affording a visit of inspection to the breakwater in progress. This was followed by a ball at the armory in the evening.

The next morning at ten the party left for Kauai direct, a twenty-four hours' run, the weather being all that could be desired. Thursday and Friday were devoted to the unrivaled attractions of the "garden island", and the spirit of hospitality experienced elsewhere in the journey was here also fully manifest; luncheons, excursions to various points of interest, and receptions at Waimea and Lihue occupied their time to the full, till boarding the steamer again for return to the metropolis.

Arriving at Honolulu early Saturday morning the day was spent "as-you-please" with bathing, surfing, etc., till the evening entertainment at the Opera House by the Boy's Glee Club of the

Kamehameha Schools. Sunday was a welcome day of rest save the initiation of a number into the secret order of the Chiefs of Hawaii, of which Prince Kalanianaole is High Chief. On Monday a tour of Oahu was made by autos, by way of the Pali, to take in the delightful scenery throughout the windward district and note the points of interest and evidence of thrift through Oahu's limited agricultural area. Lunch was served at Haleiwa, to the strains of the 25th infantry band from Schofield Barracks, through the courtesy of Major-general W. H. Carter, and after a short rest the party motored back by way of Wahia-wa and through the Ewa district, affording an excellent view of the naval station and the extent and security of Pearl Harbor Lochs, thence through Mr. S. M. Damon's Moanalua gardens and Fort Shafter to the city.

In the evening the Chamber of Commerce banquet at the Moana Hotel was a "feast of reason and a flow of soul" through the many prominent residents commingling with the distinguished guests for the interchange of thought, to fully acquaint the visitors with the problems Hawaii is endeavoring to work out, notwithstanding the disadvantages, politically, and commercially, at the hands of Congress. The main addresses of the evening were by Governor Pinkham, dealing with public works and various administrative measures, and Mr. L. A. Thurston, who presented among other subjects, the grounds of dissatisfaction felt here at the shameful inadequacy of sufficient and healthful army quarters for the troops assigned to this post. National Park and public works needs were also dealt with. Hawaii and her main industry, already handicapped under the restricted immigration laws, was shown to face a serious situation, while the coastwise shipping act worked an injustice by restricted travel of our people and a death knell to the tourist activities inaugurated, with American ships driven from the seas. Responses were made by Senators Cummins and Overman, and Representatives Mann, Smoot, Glass, Cannon and others, and it was not till the "wee sma hours" that the party broke up.

Tuesday a visit to the Experiment Station of the Planters' Association was made, and in the afternoon Governor Pinkham's reception in honor of the party was held at the residence of

Dr. and Mrs. C. B. Cooper, which partook more of a social than an official function. In the evening a number were guests of honor at a dinner by the Men's League of Central Union Church, while by far the larger majority took in the reception at the Waikiki home of Prince and Princess Kawanananakoa, which was distinctly Hawaiian in its setting, and the program of the evening's entertainment of song, and dance, and tableaux out under the tropic trees was planned to illustrate Hawaiian customs and historic events, closing with a contrasting modern scene. The fete throughout was very creditably presented by some seventy Hawaiian men and women, with the singing in both English and Hawaiian by the Kamehameha students, and by the evident enjoyment afforded, it was duly appreciated.

Thus Hawaii's proverbial hospitality was manifest toward the party throughout their stay, provision for their entertainment at all points in their tour exemplified the fact that "we don't do things by halves". They had been invited here to acquaint themselves with Hawaii's conditions and needs, to enable them to deal wisely with measures affecting the interests of this territory, whether in committee consideration or legislative action. Hawaii was asking no favors, but simple, just treatment. Throughout the circuit each island did its share in rival hospitality of the visitors in this educational tour. At all points they found Hawaii's latch string on the outside, and all inquiries relative to local conditions were freely and intelligently met.

Wednesday, May 19th, the party broke up, a number departing for the Coast by the *S.S. Wilhelmina*, and the majority the following day per *S.S. Sonoma*, though a few remained to take steamer for the Philippines. A characteristic Honolulu send-off was given these departing guests, and not a few hearts welled with gratitude at the parting aloha. One member of the party remarked "if another such Congressional invitation is extended they will all want to come".

THE sugar crop for 1915 up to September 30, shipped by the various agents show 629,220 tons, which exceeds the entire crop of 1914 by twelve thousand tons.

THE "F-4" DISASTER

BY D. L. MACKAYE.

AN EVENT probably as significant as any single occurrence during this year horrified the country on March 25, 1915, when the submarine F-4 disappeared off Honolulu harbor. The nation, which seemed unable to grasp the immensity of European battle, which remained apathetic to report after report of marine tragedy, and which required the destruction of a *Lusitania* to impress it with the catastrophe of armed passion, thrilled to its core when the wires flashed the news of the loss of this vessel in the Honolulu fairway. Of mathematical insignificance, involving the loss of but twenty-one men as compared with Europe's millions, and the destruction of but a single small unit of the American navy against Europe's proudest battleships, the event nevertheless dominated the interest and aroused the sympathy of the United States out of all apparent proportion. Yet it had a deeper meaning, involving even so great a thing as this country's own safety.

The poignant sorrow the loss of the F-4 conjured up was nowhere so great as in Honolulu, where it was felt personally. On that eventful night the city, whose cosmopolitan interests do not usually endow it with community of spirit, lined the wharves of Honolulu harbor, silently watching the flickering lights of the rescue parties in the fairway and reviewing in its mind with unmerciful precision the agony which the dark waters were at that moment probably concealing.

When the submarine flotilla, consisting of four units of which the F-4 was one, left its berth on March 25 for the usual tri-weekly practice, the hulk *Bennington*, which is what remains of the U.S.S. *Bennington*, the death ship of San Diego harbor, was towed across the bows of the F-4. To the superstitious among the sailors the *Bennington* has always been a hoodoo ship. To them, when it crosses the bows of a vessel, that vessel suffers misfortune. A short time after this occasion the F-4 had dived to her last resting-place.

The failure of the vessel to reappear with the flotilla at dock was a cause of uneasiness; no further word of her in the next

few hours startled all with a premonition of disaster. The flotilla went back out, accompanied by its tender and tugs and commenced a search as a precautionary measure. As surface cruising was exchanged for dragging and dredging and still the sudden void in life created by the F-4's disappearance was not filled, the tightening about the hearts of those searching for her grew greater. The inevitable conclusion that the craft had gone down instilled a great fear.

Yet it was late afternoon before the news of the disaster crept slowly up through the town from the waterfront to be met first lightly and with disbelief, and to horrify later with the first realization of its truth. Great bubbles of oil broke monotonously over the spot where the submarine went down. The sea swallowed her and smiled at her rescuers. They could not get in touch with her.

During the next days, within the time allotted by experts for the continuing of life, all that mortal man could do was done with that feverish competence and sacrificing disregard of personal consequences that distinguishes Americans in the presence of danger to others. G. B. Evans and Jack Agraz, the divers of the flotilla, repeatedly descended to record depths with no portion of their armor except their helmets, and were repeatedly prostrated upon their laborious return to the upper world. But these efforts were unavailing and on the eighth day Honolulu breathed a prayer for the men to whom it had not said farewell.

The submarine was located in over fifty fathoms of water, but lines could not be secured on it at that depth. When every fibre of the rescuers was strained in their last effort, when hope was dying in their hearts for the men beneath them, but when the last bit of cheer was afforded by a bulky object that had been caught on the drags and which was coming up, they were mocked by the appearance above the waves of a forgotten anchor of a trans-Pacific liner.

Eight days or so after the F-4 sank, hope for the men was actually given up although any reason for it had ceased some time before. A breath was taken, different plans were worked out, and the task of raising the submarine was commenced anew,

more soberly and sadly. For several months intermittent work was kept up, the sea rising on every occasion when success seemed assured, snapping the ropes and cables, and driving the mosquito fleet back to harbor.

The F-4 sank on March 25; and although the date for her salvage was set hopefully for day after day, it was not until August 29 that she was again seen by man. During the period of this work four naval divers attached to the Atlantic units of the fleet, under the direction of Chief Gunner's Mate Stillman, broke all records for diving, descending to the submarine in her original position over three hundred feet below the surface.

Upon her recovery a naval board examined the battered shell, deduced therefrom a cause of the disaster and in a report of 75,000 words has submitted this reason to the government, which in turn, has not made it public at this writing. It is supposed to contain the cause of death of twenty-one brave men and in all probability it points the way to safeguard the lives of scores of others.

It is apparent, however, that it is too late, by many months; that perhaps if what is known now was known last March these twenty-one men would not have died. It is a fact that the country has universally criticised the navy department for the condition of affairs on the day the F-4 went down. To the engineer, devices to denote the position of a sunken submarine are simple, yet the rescuers wasted over a day in even locating something and then hauled up an anchor. There was no diving bell on the submarine tender *Alert*, or other devices of similar purpose, and the diving bell that was made three days too late, was never used.

These facts, this lack of foresight, aroused the country. Some portions of the press called it incompetency, others by a kindlier—or, on occasion, less kindlier—name. Yet the men of the submarine flotilla, following the tragedy, labored like men and heroes for the lives of their comrades. Their divers exposed their lives freely in the hopes of gaining even a single hour in the fight. All that unaided man could do, they did.

The whole was a concrete lesson and the nation read it more or less correctly. The tragedy of the thing indelibly impressed

that lesson on its heart; the United States had for years scorned the mechanical preparedness which had been preached to them by the only men who knew, who were the only men who could not get a hearing. The nation depended upon its men, their patriotism, their courage, their alertness and those peculiar virtues which are an American inheritance.

And here was an example where those virtues were fully displayed; where the nation's men in the service did what the country knew they would and all to no avail. They neither saved the lives of their comrades nor are they protecting their own now as, week after week, they glide out of America's harbors and sink beneath the waves beyond in their preparation for a future conflict.

It was undoubtedly in this form that the horror in the Honolulu fairway on March 25, 1915, impressed the United States. Like all great lessons, it required the lives of the country's best, and it can but be a matter of devout hope that the legislators who have hitherto bolted the door with platitudes, will reflect upon what has happened and adopt a more substantial material in their policies.

HONOLULU'S WATER QUESTION.

MUCH solicitous interest has been manifest this past summer over the constantly recurring annual shortage of Honolulu's water supply, resulting in the usual restrictions of curtailing, or entirely suspending, irrigation privileges, the water at such periods being also noted as unfit for domestic use. Protests against this state of affairs without diminution of rates for the non-supply have been lodged with the authorities, and the long-suffering public is to await investigations for possible source of increase or added supply. This comes too at a time when the annual water rates are being increased, while that to shipping is modified. The general adoption of a meter system is claimed by its advocates as a remedy at hand, but so long as the city population increases and expands its area, it is self-evident that an adequate increased supply must be secured.

CORALS OF KANEOHE BAY

BY ARTHUR L. MACKAYE.

PROBABLY no other one spot in the Territory of Hawaii can show such a wonderful variety of coral as the waters of Kaneohe Bay and the surrounding reefs on Windward Oahu. Originally what is now the bay was once the deep pit of an immense crater, but in the dim geologic past one side of this crater blew out to sea, the waters rushed in and for ages colonies of coral animalculae have been building up the reefs within the outer circle of the underlying volcanic plateau. Considerably over one hundred varieties of corals are known to exist in Kaneohe Bay, where lie the famous Coral Gardens, the sheltered formation of the encircling shores being advantageous to the propagation of nearly all the species inhabiting the Hawaiian waters.

On the outer reef, extending for many miles from Pyramid Rock on Mokapu Peninsula, to Mokolii Island off the point where the Waikane mountains jut out into the sea, the windward island surf thunders its rhythmic bass, while through the deep channel the bay proper receives its volume of fresh ocean water, clear as crystal and warmed in transit by the sun as it flows over the coral sands on the shallow reefs. The word Kaneohe is an ancient one in the Hawaiian language with no special significance to the average Hawaiian of today, but, according to the best information of old residents of the ancient kingdom of Kaneohe, it means in substance, "deep, still channels." It is in these deep, still, reef-lined channels which radiate throughout Kaneohe Bay that the great variety of corals thrive in the marine climatic conditions caused by the giant combers of the northern Pacific continually furnishing the bay with pure ocean water which is tempered as it flows.

In coloring, the corals of Kaneohe run the gamut of shades of yellow, red, green, brown and lavender, with snow-white corals making bright spots along the reefs. A feature of the Kaneohe reefs is that while some corals are found plentifully on one reef the same species may be entirely missing, or at least scarce, upon the very next neighbor reef. On the outer reef, especially,

grows masses of coral never found in the quieter waters, sheltered from the heavy surf. But within these still waters are found the delicate varieties so much admired by the visitors to the Coral Gardens and which are seen through the medium of glass-bottom boats.

Volumes have been written describing the varieties of coral found in the Hawaiian Islands, most of which are found in Kaneohe Bay, and to name them all would take up much more space than could be incorporated in this short article. But there are three genus particularly which are found in Kaneohe, two of them especially widespread, these latter being the *Montipora* and *Porites*. The other genus is the *Pocillopora*. This last genus comprises the isolated colonies of branched coral, which are especially valued, when cured properly, as ornaments. The species of the *Pocillopora* are usually of symmetrical form, generally semiglobular, and in color varies from pale pink to transparent pale brown. Among some of the species of the *Pocillopora* in the Hawaiian Islands and which are known to be, or should be, found in this vicinity, are the following:

P. Cespitoa:—(Dana) This is a small, rather crooked, but delicately branched coral with blunt tips bearing little points to the branches. There are three varieties of this species. It bleaches very white when cured.

P. Ligulata:—(Dana) This is a somewhat larger and heavier coral than the cespitoa; the radiating branches are comparatively straight, growing broader toward the tip and are rather thin and with small side nodules.

P. Meandrina:—(Dana) Very similar in form to the ligulata, but with thicker and heavier branches and with numerous more strongly marked and closely set nodules along each branch.

GENUS MONTIPORA: Together with *Porites* this genus forms the bulk of the corals of Kaneohe Bay. It is exceedingly varied in formation, its various species showing great divergence in color and shape.

M. Verrucka:—(Lamarck) This is one of the commonest species, growing from a depth of over thirty feet to within a few feet of the surface. It can be seen lining the outer walls of

the inner reefs. Its growth-form may be either encrusting, leaf-like, branching or semi-solid. The cells cannot be distinctly seen without the aid of a magnifying glass. One of its characteristics is the numerous nodules projecting from the upward growing surfaces. It varies in color from pale buff to gray-brown. It is fragile in texture, although sturdy in appearance and on that account favors the quieter waters of the inner bay.

M. Flabellata :—This is a small, thin and encrusting coral, growing over other species of coral. It is generally found on the outer reefs, is massive and of a firm texture, but irregular in shape. A distinctive feature is the small nodules on its surface which have a tendency to run together.

GENUS PORITES: This is one of the most important and widespread of the corals and its species shows exceeding variation, as its form of growth may be encrusting, branching or massive. One of its characteristics is the fine, closely set cells and smooth outer surface of these species. This is due to the lack of the usual skeletal projections so that the species of this genus have a slimy feeling when fresh. The color variations are great, generally in shades from greenish-golden to deep olive brown.

P. Compressa :—This species varies in growth from nodules to branching, and has been split into sixteen forms with every probability that it will be still further subdivided into other forms. Four of the forms—*granimurata*, *elongata*, *abacus* and *tumida*—(described by Vaughn) have been found in Kaneohe Bay and many more probably will be.

P. Duerdeni :—(Vaughn) A species with thick, bulbous branches, which is not very common, and found, so far, only in Kaneohe Bay.

P. Evermanni :—(Vaughn) This is a species of irregular and bulbous coral, not very common.

P. Lobata :—A heavy-lobed coral with many sub-forms. Three of these sub-forms, *gamma*, *delta*, *epsilon*, have been found in Kaneohe waters.

There are many other varieties of corals, some of the most interesting of which are commonly found at the Coral Gardens. Among these are:

Leptastrea agassizi :—(Vaughn) This is a small encrusting

coral with slightly projecting cells about three-sixty-fourths of an inch in diameter. Through a magnifying glass a mass of cells has the appearance of a bouquet of beautiful star-flowers. It spreads in colonies over the surfaces of other varieties of dead coral on both the inner and outer reefs. Its color is a yellowish, golden-brown.

Cyphastrea ocellina :—(Dana) Very similar to the leptastrea, but with smaller cells. It is an encrusting coral and as it grows may form lobes or broad nodules. It is a rich brown in color.

Favia hawaiiensis :—(Vaughn) This is an encrusting form of coral with cells one-thirty-second of an inch in diameter lying close together. It forms rather large colonies by spreading over the dead colonies of other species. It is light brown in color.

Fungia scutaria :—(Lamarck) This is one of the forms known as "mushroom corals" and are the only corals in these islands which are to be found detached in their maturity. Their habitat is in the bottom of the pools on top of the reefs, preferably where washed by the waves.

Pavona varians :—(Verrill) An encrusting coral growing into large colonies, between the lines of whose cells are continuous ridges projecting about one-eighth of an inch and which diverge in all directions; the cells follow the lines. In color it is a pale brown.

Stephanaria brighami :—(Vaughn) A small spherical "clump of stubby branches" with indistinct cells. The colony is generally symmetrical in growth and is beautiful as a small specimen when bleached. It is rather soft in texture and breaks easily.

Dentrophyllia manni :—(Verrill) One of the most beautiful and interesting of the corals of Kaneohe; in color a dark red, it grows in clusters on the outer slopes of the inner reefs, each detached cell standing up like a tree-tulip or a horse's tooth,—whence its name—and are often seen through the glass-bottom boats at the Coral Gardens.

Beside the corals in their wonderful variety which are found in this section there are also a great many species of coralines, often mistaken for corals, but in reality a sea-growth instead

of the skeletal home of the true coral insect. It is asserted by those who have made a study of corals and coralines, such as Dr. C. Montague Cooke, curator of the Bishop Museum, and John G. Stokes, also of the Bishop Museum, to whom the writer makes acknowledgement for much information, that undoubtedly there are many varieties of corals which have not been found or described, yet which may exist in these waters.

[Another attraction to visitors to Kaneohe waters, to be mentioned in connection with the foregoing, is the variety of varicolored fishes to be seen darting in and out of the coral ledges, giving life and brilliancy to a scene of intense and fascinating interest.

A more recent discovery is reported, giving it additional fame for its variety of marine growth, through the locating of an underwater coral island abounding with a variety of sponge growth, some of tree character, and others in beds of crimson and purple, interspersed with various forms of seaweed and coral.

The fact that this foregoing marine "Mecca" is within an hour's easy and delightful auto ride by way of the famous Nuuanu Pali, noted alike for its unsurpassed scenery and its identity with Kamehameha's victory over the forces of Kalanikupule in the conquest of Oahu in 1795, is ground sufficient for the steady stream of visitors from Honolulu this past year, both *kamaaina* and *malihini*, in their quest for attractions and subjects for scientific investigation, and rendered all the more convenient since the establishment of the Coral Gardens Hotel and its special aids for the fullest enjoyment of the attractions of the vicinity with the least loss of time.—Ed.]

THE reported bottomless pit of the Hualalai crater, of Kona, Hawaii, has found a solver to its hitherto mystery this past summer, in Mr. L. A. Thurston, who has measured its depth and found it to be one hundred and ninety-four feet.

HONOLULU has been hard hit by the La Follette Seamen's Act, which has caused the withdrawal of all steamers of the Pacific Mail line from this ocean, and their sale to an Atlantic concern.

THE LEGEND OF KANEHUNAMOKU

THE PHANTOM ISLE; HOME OF THE MENEHUNES AND MU'S.

WHEN the earth was young, and the inhabitants thereof were the children of the gods, of whom Kane and Kanaloa were recognized by the lesser deities as their supreme lord and master, emanating from Manoikulani (male) and Hihikalani (female), there was born to the said Kane and Kanaloa on the night of Hilo and Hoaka a son, who was named Kanehunamoku, who moved the flowers of Ku-kahi, there being four Kus, and four Oles. Kuiohina made possible the equilibrium of Kanehunamoku in the night of Mohalu as it evolved in space, as also during the periodical visits to Kane and Kanaloa on the nights of Akua.

The God Manokiulani held sway at the head of the clouds in the blue sky, whilst Hihikalani maintained her court at the head of the rolling clouds, and the coming together of these two clouds produced a fog or mist within the darkness of which gave birth to the white clouds which Kane and Kanaloa mistook to be a bundle rolling about in space, and, as the story goes, Kanehunamoku was therefore a direct descendant of Manokiulani and Hihikalani; in evidence whereof the lightnings flashed, the thunders roared and the earth quaked as Kanehunamoku, at birth, became separated in the rolling blood-tinted pyramidal clouds.

Upon Kanehunamoku's attaining man's estate, he entered into the flower garden of Kaonohi, the possessor of a pool of water named Manowai. For this trespass Kanaloa became angered at this conduct of her son and, consulting Kane thereon, advised the making of a law—the lightning—whereby Kanehunamoku and Kaonohi were to be banished to another land forever; that they were not to set foot on terra firma; that their land should forever move in space; their people should be dwarfs and diminutives, and their companions would be lizards, dogs, and fire. The law of dwarfishness was to be binding upon his people, and his children were destined to build rocky lands.

Kane and Kanaloa therefore created a floating land named

Kueihelani, to which Kanehunamoku was exiled, being a land moving about in the face of the clouds in the midst of utter darkness, and so lived they all without the least idea that they were on a land moving in space driven hither and thither over the deep blue ocean by the varying winds. It was only at night, however, that this mysterious land would be in motion, like the spirit of the perturbed.

Whilst Kanehunamoku was meandering over the land of Kueihelani he was impressed with the abundant growth of its many varieties of trees and fruit; and thus he traveled for a long period, without the light of day, until he came to a spring, the waters of which he drank that he might be endowed with wisdom, but it did not, however, lessen his ardent spirit. His proud and vigorous manhood seemed to assert itself all the more. Thus he remained at the spring, with the thought that there was no foundation beneath the land he was on. The trees and shrubbery surrounding the spring grew in the greatest profusion and luxuriance, such as the ape, awa, sugar-cane, bananas, potatoes, ti, ohia, aalii, koa, kukui, lama and others such as are found in Hawaii, but they did not satisfy.

While preoccupied in mind with the scenery about him in his loneliness, he soliloquised to himself thus: "How strange that I should be here. I have not seen any of those beautiful lustrous and shimmering clouds I was wont to see. Who are my companions that I could say were fine-appearing and handsome in this voiceless abode of mine? As I look out on the dizzy heights beyond, they surprise me. Where am I?—living in the shadow of night, below, below, in the uttermost depth?"

He cried out in exclamation, and his voice was like the sound of the beatings of kapa of ancient times, hollow and sepulchral, as emanating from some cave where there was a gathering of women at their vocation of kapa-making.

While Kanehunamoku was thus engrossed in deep meditation, with tears streaming down his face, there was wafted to his ears on the still, calm air an ethereal voice, saying: "Oh, you, who were deported from below! Continue on in thy floating kingdom over the blue ocean, the deep sea, the red sea, and move over every part of the earth. Thou wilt never behold

the beautiful again, thou proud and haughty man to the mighty Kane, the supreme and sacred God by what you did to the sacred and holy place. Let me ask you, what is your desire? Tell me."

"My wish is, that there be two of us in this place. Oh, you caterpillar! You worm! Think you, and give me an immediate answer: a wife for me! And she shall be Kaonohiula."

Then a voice came forth from the ti plant as its buds came into bloom; the thundering voice of Kanehekili, with the flashings of Kauilanui playing havoc with the floating land. While the thunder was raging and the lightning flashes were darting here and there, hailstones began to fall, and then a brood of little white chicks came running towards Kanehunamoku completely covering his front, whereupon the thunderous voice spoke again saying: "Take care of these thy people; your descendants shall be their lords; thou art to remain on this floating world within the four corners of the heavens; thy land shall be sacred; it shall not be seen in the light of day, except in certain periods of Mohalu (July) and Akua (August), and should it be observed on the outskirts of Haena, Kauai, in the months aforesaid, then know that Kanehunamoku is near on the floating land of Kaonohiula. This is an opua cloud of Kane and Kanaloa; a beautiful cloud with a woman's calm sea; a wind-tantalizing cloud; and because of the beauteousness of this cloud hence Kanehunamoku's earnest wish that Kaonohiula be his companion to roll the bowls of Kane from one end of the heavens to the other. It was a game in which both were adepts. The outer bowls in the dense darkness of the heavens would be the ones for the gods to amuse you with.

Again the voice called forth: "Oh! you vagabond of a man! To the end of your days, on the night of Hilo, you will be let loose over the great expanse of oceans; the tempestuous seas of Kane. I will make known to you the great truth, that there are three stratas to this movable home, floating over the oceans:

"First:—The first strata is the girdle encircling your land, which is yourself, and is named Kanehunamoku.

"Second:—The next is the inside strata, named Kueihelani.

"Third:—The last strata is Nuumealani, and between these two latter will be the flower garden of Uluhaimalama. Flowers of every variety and great fragrance are to be found only in Nuumealani. Kueihelani will be the abode of the wife of Kanehunamoku and their children. The first child Moonanea, will be a reptile; the second, Piliamoo, a dog; the third, Halulukoa, a caterpillar; the fourth, Halulumanu, a beautiful girl, endowed with supernatural powers; the fifth, Kuilioloa, will be a girl of fire; the sixth child, Ioimoa, will be endowed with sacredness, upholding family purity; the seventh, Kaonui, will be an ordinary girl child. In all, the family group will be twelve in number."

Kauhai was the one assigned to set the land in motion, while Kanehunamoku, the chief, would preside over the destinies of Kueihelani and its pigmy people, comprising the Menehunes, and the Mu-ai-maia, banana-eating-bugs.

At a locality known as Laau, towards the mountain in Wainiha, Kauai, was the place where this latter race of people is said to have once lived and made their home. The traditional history of the Mus and their various occupations are not generally known though said to have been fully recorded, wherein is narrated the story of their voyage; how they landed at Peleiholani, and were taken across the mountains and lived at a place called Laauhelemai. On their arrival there they found bananas, awa, and a great variety of trees and plants. Water flowed freely in the gulches and they tilled the soil of the up-lands. They cultivated bananas and dried the fruit, wrapping it in bundles of banana leaves in large quantities as food for themselves. Their clothing was made out of dried ti and banana leaves plaited together. In their own country this was their clothing, and being a warm land food plants grew spontaneously. Their country was described as a land that moves about in the ocean. Other lands could be seen therefrom, but it could not however, annex with any of them.

As to the division of lands, above and below, they are Kueihelani, and Uluhaimalama. This latter is a garden in which are all varieties of fragrant flowers. Nuumealani is the land

of the Mu people as well as of the Menehunes and is peopled by small men in vast numbers.

The Menehunes are smooth, similar to the people of this land, but these latter have characteristics indicative of human beings. The abdomens of the Menehune people are very distended while those of the Mus are round. The former do not eat bananas but live on the smallest of fishes, nor do they eat any of the wild fruits of the land; they have other people provide them with food.

During the night of Mohalu the wild fruits would arrive in great abundance causing great commotion and the hum of voices would break the silence. Kanehunamoku is then prepared to move with his people to Peleiholani and Waiolono. It was at Peleioholani that Kueihelani made the first connection, and it was there that the Mu people, with a certain number of the Menehunes, divided. The Mus travelled over the mountain ranges until they arrived at a big gulch with an abundance of water and there lived with their wives and other things belonging to this diminutive race. The greater portion of the people remained on the land of Kueihelani, and knew nothing of its changes, or heeded the summons to make preparation and assemble together for the forward movement.

Ikuwa (loud) is the voice of the Supreme ruler, and some of the overseers of the garden of Uluhaimalama, Uhawao and Uhalaoa led the migration toward the Kalukalu (vegetable growth). Crashing were the sounding voices moving towards the desired haven, Waimea. Papaenaena was the guard over the Menehunes, and he was an important overseer who laid out work such as the chiefs of Kauai, Kikiaola, Puulima and the Konohikis desired. Two messengers were sent by Kikiaola to convey the wishes of the people of Waimea to Papaenaena, saying: "We came to get you and your people to build the dam and water-course of Waimea; this is the message of our chiefs." "What are the names of your chiefs?" he asked. "Kikiaola is our king, and the high and sacred chiefs are at the temple (heiau) of Mokihana," they replied. They also had a second request, which was: that the Princess Namakaokahai, sacred to the gods, become the wife of their high chief. For doing the

work on the dam at Waimea, the overseer gave consent, but the second request was refused.

After the messengers had delivered their message they returned to Waimea and reported that Kanehunamoku's people were agreeable to the building of the water-course, and in compliance the construction of the dam of Waimea was begun during the month of May (Makalii), in the reign of King Kikiaola.

Kanehunamoku had foreknowledge of these matters, for on a certain occasion, while enjoying life his ears began to ring, whereat he gave a deep sigh. Simultaneously he was startled by the following exclamations:

"Say! Where are you? The supreme ruler of the land floating on the sea! There is a messenger coming to get the princess and her diminutive people. Here is Hulukuamauna, the great jumping kahuna, a person endowed with great foresight, who said that only the Menehunes could build the dam of Waimea, though its chiefs may increase the number of their people many thousand. The only ones who can do so are Kanehunamoku's people. It is impossible for Waimeans and their kahunas to build it, much less the priest who stands in the sacred place of the divine kings."

While Hulukuamauna and others were standing before the pulous (tabu sticks) in front of the house of the kahuna who glides in the face of the sun, Kane spoke to him, saying: "Where are you? Go to Kanehunamoku, personally, for the services of his diminutive people. Should he consent, the trouble will be overcome, for the dam could never be built by the people of the land even though they come from the seashore of Polihale to the waters of Hanapepe. It is the people of the floating land who can accomplish the task."

Hulukuamauna asked: "What presents and sacrificial offering shall be made to you, O God! for its success?"

"One sacrifice," answered Kane: "the sanction of Kanehunamoku is required; then the work on the dam of Kikiaola will begin; it will not be finished by the offer of a fathom pig, the red fish, or the silver-gray fowl and the black coconut. He will set the date when the work will start, and it will be your duty to obey the instructions of the child of God, Kanaloa, until the

task is complete. You are to go on the day of Hinaiaeleele, or else the first Mahoe. Do not go with any offerings, but inform him of my firm belief in the accomplishment of the work, to carry out the wishes of the chiefs of Waimea."

On the arrival of Hulukuamauna in the presence of Kanehunamoku, there appeared a messenger from Kane, bearing a branch of aalii, having very fine red round fruit. This was a sign from Kane to Kanehunamoku, who took the branch and examining it closely he realized that there was some work of great importance to be performed. Koahulu on his return presented himself before his lord and master, Kane, and said: "So you are here?" "Yes," was the answer, with the query, "Where is the old man?" "He is at home." "How is it? Has he considered it?" "Yes, and he sends his felicitations, saying that the project will be undertaken. On the day of Hinaiaeleele they will arrive at Peleiholani and Waiolono. So said he."

The following day the kahuna returned and was advised of the favorable outlook. He was then instructed to fly and meet Kanehunamoku and tell him the dam of Waimea is to be constructed on the night of the first Mahoe. Upon the completion of the work the king, Kikiaola, is to sleep on the altar in compliance with the instructions of Kanehunamoku, that night being sacred to Waimea and the water project. No person, be he chief, priest, or astrologer, shall light any fire, nor shall there be any torches lit, nor shall any of the people of Waimea stir abroad that night; should they do so they will be put to death. The king, whose dam this is, shall sleep at the lower end of the ditch so that he may be deluged by the water. All these things will come to pass; he will not awake, and the kahuna will draw him out of the water, then will this ditch be completed by the sacrifice of a man; the sacrificial offering must be a chief, and as the waters flows over him on its way to the sea the Menehunes will disappear and no person will witness their departure.

This is the legend of that celebrated water-course from time immemorial to this enlightened age.

Namakaokahai went back to Kueihelani with no intention of ever returning, as did also Kanehunamoku.

Upon the departure of the Menehunes and the Mus from

Laauhelemai, two of the latter were left behind, as they were fast asleep in the dried banana leaves, oblivious to all that was going on about them. These diminutive races went back to Kueihelani according to the command of Kanehunamoku.

“HAWAII”

THE BEST-KNOWN BUILDING AT THE PANAMA-PACIFIC EXPOSITION, 1915.

BY ALBERT P. TAYLOR,

Secretary-Director, Hawaii Promotion Committee, Honolulu.

ALMOST in the shadow of the colorful Food Products building, just across the way from the imposing California building, and but a stone's throw from the splendor of the Fine Arts Palace, whose stately columns and facades are reflected in the placid Mirror Lagoon, the Exposition building of the Hawaiian Islands, as colorful as any of the great palaces surrounding it, became a diminutive specimen of architecture, but merely by comparison with those nearby structures which occupy acres of grounds. Although a liliputian amongst the architectural bobdignags, the Hawaii building was a colossus in popularity, for the strum of ukuleles and the tinkle of guitars gently touching passers-by, compelled entrance to the building, where the charming atmosphere of the Hawaiian Islands was immediately felt, and visitors left it filled with the desire to some day voyage out of Golden Gate across the twenty-one hundred miles of sun-kissed seas and see, for themselves, this “Paradise of the Pacific”.

Hawaii's building, to some extent, followed the architectural plan employed for many of the larger exposition palaces and conformed almost entirely to the wonderful color scheme wrought by artists of world renown.

Beyond the Hawaii building are the structures erected by sovereign states of the American Republic and foreign countries. The buildings of the latter conformed to architectural standards abroad; the buildings of the states were, in many instances, of public and historical buildings, structures which

played an important part in the history of the United States. There was the replica of Mount Vernon, Washington's home; a colonial building in New Jersey where Washington once established his headquarters; the famous Independence Hall at Philadelphia from whose tower the Liberty bell clanged its message of liberty to the thirteen colonies; the golden-domed state house of Massachusetts, in Boston; there was an acropolis for Oregon, whose columns were fashioned from giant firs; there was China with the replica of the forbidden city of Pekin; there was Japan with its beautiful temples and gardens; there was the Ottoman empire with its replica of the Seraglio; there was the beautiful collection of stately buildings for Italy; the massive palace-like structure for Canada; the replica of an old Spanish cathedral for Bolivia.

Hawaii's building was not a replica of any structure in the Hawaiian Islands, nor did it conform to any island standard, for there is no island standard of architecture; but it was a building designed to encompass the real atmosphere of Hawaii with its giant ferns silhouetted against the walls and with its Hawaiian musicians ensconced in a garden of ferns of tropical foliage; and, above all, the extension in which was housed an aquarium whose tanks were filled throughout the Exposition period with hundreds of specimens of the beautifully-colored fishes from Hawaiian waters.

The Hawaii building occupied a corner at the junction of two of the busiest thoroughfares in the Exposition grounds. Opposite was the California building entrance; over to the right was the Fine Arts Palace; across the way the Food Products building. One street passed the front of the Hawaiian building to the doors of the California structure. Over the other thoroughfare flowed the hundreds of thousands on their way to the State and Foreign buildings. Hawaii was at the real "Cross-roads of the Pacific" there, and the name seemed appropriate to the little building which represented "Hawaii—the loveliest fleet of islands that lies anchored in any ocean".

The California building throughout the Exposition period was the scene of brilliant receptions, for the Golden State was hostess to all the world. The crowds surged and re-surged past the Hawaii building and massed in front of it. Lured by the

ear-haunting melodies of the Hawaiian musicians which drifted through the doors and filled the streets with harmony, the crowds turned and entered. Their senses were gratified by the sometimes rollicking, and sometimes pathetic, music of Hawaii nei.

While thousands upon thousands of people passed in and out of the Hawaii building, many other state structures resounded with emptiness.

The whole idea of Hawaiian representation at the Exposition was to gain more publicity for the islands, publicity which would attract the traveler, make the islands better known, and better understood, and cause them to become the tourist mecca of the travel world. It was a business proposition which was placed before the legislature of 1913, which appropriated \$100,000 for Hawaii's representation at the Exposition. Of this amount, less than \$40,000 was expended for the building proper. This was small in comparison with the amount expended by other states, but in results, from publicity and from getting Hawaii better known, and better understood as a modern, up-to-date insular community, the results have been fifty-fold more than for the larger expenditures made by other states.

Through whose eyes should Hawaii's building and exhibit be viewed? Islanders who have visited the Exposition have returned criticising the building because it was too small, because it had this or that color, or lacked another color; because Canada had an exhibit of its resources, while Hawaii's building did not; because other buildings appeared to be more pretentious, and so on.

Travelers who went to the Exposition and saw the Hawaii building, and as a result came to the Hawaiian Islands, praised the little building, its coloring, its fishes, the genial atmosphere, and wondered why Islanders were prone to criticise it otherwise.

To those who have lived in the islands many years, the beautiful flowering trees and plants, and the rare combination of climate and foliage, sometimes become monotonous because it is the same every day. Ride in a street car behind two tourists and listen to their exclamations of delight at the wonderful blossoms on the flowering trees and the exotic bloom of the plants, and one can understand why Hawaii's building, then, at the Exposition, should be viewed through the eyes of the stranger.

The building was not erected merely for Islanders to look on, but to attract the attention of the rest of the world, and in this respect, Hawaii's building certainly made a bull's eye.

Almost at the close of the Exposition, at a luncheon given by the Hawaii Fair Commissioners at San Francisco, Chief of Special Events Hardee, of the Exposition staff, said with sincerity: "Hawaii is the best-advertised country in the world."

To Hawaii came the distinction, in 1914, of having the most spectacular and unique ground-breaking exercises of any of the buildings. In 1915, the dedication of the building attracted attention far beyond the expectations of the Hawaii commissioners, and the Exposition officials, also. On June 11th, when Hawaii's Kamehameha Day was celebrated, the "Night in Hawaii" pageant on the Mirror Lagoon in front of the Palace of Fine Arts proved the most astonishing incident of a long list of pageants, for with Hawaiian canoes and Hawaiian music, and island girls assuming for the time being the ranks of princesses, the "Night in Hawaii" was a wonderful surprise to the tens of thousands of people who witnessed it, and again gave nation-wide publicity to this "Baby Territory". Even on Hawaiian Pineapple Day, Tuesday, November 10, 1915, the most luscious of all fruits, the pineapple, was elevated to royal honors, and all the Exposition gave homage to this king of fruits from the Mid-Pacific, with publicity of immeasurable value.

Even almost at the very close, under the auspices of Hawaii, honor was given Mark Twain, the great American humorist, the Exposition, with Nevada and California, uniting with Hawaii in a great tribute of esteem to the writer who gave Hawaii two graphic descriptions which are more used in its outgoing literature and by lecturers and writers than any others, these being his famous "prose poem" and his "Hawaii—the loveliest fleet of islands that lies anchored in any ocean".

Seen through other eyes, Hawaii's building and representation at the Panama-Pacific Exposition has been of inestimable value from a publicity standpoint to the Hawaiian Islands.

THE PINEAPPLE INDUSTRY IN SINGAPORE

PREPARED FROM REPORT OF WALDO H. HEINRICHES BY
J. P. MORGAN FOR THE HAWAIIAN ANNUAL.

HAWAII furnishes the United States with canned pineapple; Singapore does the same service for Europe. It will probably be only a matter of time, however, before our greatly superior product will find its way in increasing quantities into the markets of the Continent and force the Singapore factories either to withdraw from the competition or make radical changes in their standards of manufacture. The following study of the packing methods in use in Singapore will, by comparison, indicate the remarkable progress towards an ideal of sanitation, cost reduction, mechanical efficiency and elimination of waste which has been made by the industry in Hawaii. It is very likely that the present Great War has given a severe setback to the Singapore canneries, and the return of peace should find our producers in excellent position to capture much of that foreign trade in pineapples.

A typical Singapore pineapple factory is the Chong Hin & Company organization. It is situated on a back street in the midst of the Chinese section, surrounded by squalid lanes and ramshackle dwellings. On one side of the building is a large sewage canal which seems to depend on the tide for its flushing, for at the time I visited that district, the black, muddy bottom was blistering in the sun. The jinrickisha runner stopped in front of the office, which is a low brick building covered with blue paint. After rapping on the door I was met by two Chinese, apparently the managers. Neither of them spoke a word of English, so that I was left entirely to my observations and to what primitive gestures I could make for them to understand. I was amused to see that they took me for a prospective customer and I did nothing to change their belief as it worked out in my favor. As I passed through the office I noticed just one sleepy bookkeeper who was poring over a Chinese notebook and clicking his abacus.

The pineapples came in from the "gardens" on two-wheeled, crated bullock-carts driven by Hindus. The fruit had evidently

been tossed into the carts without great care, for in many cases the skin was bruised and moist with juice. After much effort I ascertained that there are two chief sources of these pineapples, the outskirts of Singapore and Jahore on the mainland. When I pointed at them and with a wave of my hands and a shoulder shrug asked "Penang?", one of the managers shook his head saying "Nein, nein." This word may have come over from the Dutch settlements on Java.

The pineapples are tossed from the carts into heaps scattered around the courtyard and on the public highway alongside the cannery. Without any selection at all, little boys gather them into large baskets holding some twenty or thirty fruits, and the baskets are then carried by hand into the cannery. The fruit that I saw was very small and green and still had the bushy crown attached.

From the baskets the fruit is rolled out on large tables. At these tables are seated perhaps a hundred Chinese laborers, and as we came through a few sharp commands from my guides made a number of these workers remove their bare feet from the tables on which the pineapples were being cut. Doubtless they thought it made a bad impression on a large prospective buyer to see such a conspicuous violation of simple cleanliness. Ordinarily the men sit on wooden stools about two feet high.

All the men in this department are armed with heavy knives like butchers' cleavers. They shear off the outer skin with this cleaver and cut deep enough to take out most of the eyes. It appeared to me that there was a large amount of waste here. The tops and bottoms are then cut off and the pineapple has the appearance of a cube or a pentagonal prism, depending on the condition of the fruit or the inclination of the worker. Setting this on end, he cuts it into vertical slices of about one inch thickness, and these he chops into cubes about the size of dominoes. Then he throws the whole collection into a basket which is later dragged across the floor to the filling table. None of this work made the pineapple very appetizing. The day was very hot, the men felt the heat, there were no rubber gloves, and the juice from the cutting tables ran all over the dirty, slippery floor.

The filling tables are about five feet square, slope to one

corner and have outlets into wooden buckets. Some twenty men were working here. One takes about two dozen cans, which the boy has brought from the soldering room, and places them in the center of the table. Other men scoop up the cubes of pineapple which have been brought over from the cutting tables and with bare hands fill the cans to about four-fifths capacity. Then from wide buckets about two feet high, the syrupers dip up the juice which fills the cans. The buckets in turn are filled from a large vat about ten feet long and four feet deep. How that was filled and with what degree of syrup I could not find out; but it tasted very sweet and I imagine there was an extra amount of sugar in it to counteract the greenness of the fruit. This syrup is just splashed over the cans; some may be filled, some are not. There is no regularity as to the amount of syrup or the number or size of the cubes which go into the cans. The syrup or juice that splashes outside the cans runs down again into the buckets and when they are full it is used over again, dirt and all.

The tins are then placed on wooden trays, eighty tins on a tray and one tray on top of another. They are carried by coolies into the soldering shed, where about six men are soldering by hand. A cover is clapped over the top of the can and a little tool like a can-opener is run around the edge depositing a fixative and a stream of solder. Then the cans are carried back to the cooking vats. There are seven vats in all and each vat boils two rafts of eighty tins each. The vats or cookers are on the earthen floor and are heated from below by wood fires. I timed the period of boiling to be six minutes, but that could easily be lengthened to ten minutes if the man at the next table happened to be too busy to attend to the raising of the rafts. This seems a very superficial heating, especially when it is remembered that the pineapple is the most choleraic of all Malayan fruits and that on this cook alone depends the safety of the consumer from the cholera germ. But in spite of this, I have never heard of cholera being induced by canned pineapple.

From the vats the rafts are carried to a table which might be called the "punching stand". Three men were at work here. The first man has a hammer and a sharp drill. Near the rim of the can he makes a little hole and out comes a stream of hot juice and steam, relieving the pressure within. He is

quickly followed on each tin by a man with a cup of brown liquid, the fixative. With a stubby brush he daubs each hole and then the solderer drops enough solder over the hole to seal it. The cans are then carried into an open court to cool, after which they are carried by hand into the packing room, where the boxes are made. The rough lumber for the box shooks is brought in alongside the building and one man cuts it into desired lengths while another nails the boxes together. It seems a very slow and laborious job.

The tin for the cans is bought by the cannery in bundles, each sheet of tin being about two feet square. Three men work at foot-driven machines; one cuts the tin into rectangular pieces, another cuts out the tops and bottoms and the third puts the rectangular pieces into a machine that rolls them into cylinders. Then a boy gathers the ends and the cylinders into a basket and carries them to the soldering shed, where the seam in the cylinder is soldered and the bottom is attached.

I could not help comparing all this slipshod method of work with the excellence of outlay and economy which we are used to in Hawaii. In this cannery the waste and the refuse all falls on the floor and the only method I saw of getting it out of the way was that used by a Hindu with a basket and a small hand hoe and shovel. He scrapes the scraps from underneath the tables and between the stools of the Chinese peelers, dumps it into his basket and carries it out to the sewage canal. It all seemed very dirty, with no inspection, no apparent concern for cleanliness. I never saw a pair of rubber gloves, and everything is done by hand except the actual cutting of the tin for the cans. There are no automatic conveyors, no push-carts, no gutters for carrying off waste, no power-driven machinery, no free use of cleansing water, no attempt to insure any degree of safety to the users of the finished product. If this cannery were transported bodily to Honolulu, I imagine it would be a great curiosity, but of course the health officers would be down upon it within a week.

The Singapore pineapple, however, is not far behind ours in flavor. What difference there is comes very likely from the crude methods of Oriental culture. E. R. Scidmore in his book, "The Garden of the East," says:

"We reached Tjiawi, near which the finest pineapples of the islands are grown, and we bought them on the platform, great, fragrant, luscious globes of delight, regardless of the most prayerful requests made to us on arrival, that we would not touch a pineapple in Java. We did a tourist's duty to specialties of strange places for that one day, buying the monster nanas in most generous provision, and we made up for all previous denials and lost pineapple opportunities as we tore off the ripe diamonds of pulp in streaming sections that melted on the tongue; nor did we feel any sinking at heart nor dread of the future for such indulgence."

From this brief survey of the pineapple production of Singapore it can be seen how greatly superior our Hawaiian product is bound to be. With our scientific study of fertilizers, our continual turning of the soil, our naturally suitable climate, we produce an almost perfect fruit. The careful processes which are then employed in putting the ripe fruit into sanitary cans ensure an ultimate result which cannot possibly be rivalled by any other country.

INQUIRY comes again for the origin and significance of Kamehameha Day, an impression prevailing with some that it has to do with the consolidation of the islands under one ruler. As shown in the ANNUAL for 1911, in the article on Hawaiian Holidays, "this is the only one of the monarchical anniversaries kept in remembrance as a legal holiday. It was brought into existence by Kamehameha V. to commemorate Kamehameha the Conqueror, head of the dynasty." The proclamation for its observation was as follows:

"By Authority: We, Kamehameha V., by the Grace of God, of the Hawaiian Islands, King, do hereby proclaim, that it is Our will and pleasure that the eleventh day of June of each year be hereafter observed as a Public Holiday in memory of Our Grandfather and Predecessor, Kamehameha I, the founder of the Hawaiian Kingdom. Given at Iolani Palace under Our hand and the Great Seal of Our Kingdom this 22nd day of December, A. D. 1871.

"[L. S.]

KAMEHAMEHA, R."

RETROSPECT FOR 1915

DRAWING to the close of another year it is gratifying to note it as one of unusual activity in these islands, resulting in a degree of prosperity in agricultural and commercial lines far in advance, as to results, of any preceding year's record, details of which may be found on pp. 34-6. While much of this prosperity may be traced to realizing benefits from the sufferings of war-stricken Europe, it would be unjust to local enterprise and foresight not to recognize the fact that island conditions have been such as to prove a large contributor to this result, in spite of drawbacks. This benefit from our increased exports and decreased imports has made the money market plentiful for public and other improvements, yet a conservative spirit has governed in anticipation of "free sugar" possibilities.

Hawaii was favored with a larger number of visitors than usual this year, a result of our promotion and publicity effort, among whom were many distinguished guests that Honolulu delighted to honor. Yet in the enjoyment of this tide of success the direct San Francisco steamer of the Oceanic line, and the Pacific Mail steamers were all withdrawn, suddenly seriously curtailing passenger accommodations. Hopes are entertained of relief to this situation shortly from other sources.

Elsewhere in this issue is shown the anxiety that pervaded the community at the F-4 disaster. Sympathy found expression in various ways, including contributions of quite a sum in aid of the bereaved families. Honolulu, and in fact all Hawaii, has responded liberally also throughout the year to the various calls for relief of war sufferers in Europe, and the end is not yet, for aid is still going on in a quiet way. Nor were appeals for China and poor Armenia in vain.

Decision upon the site for the long-mooted federal building is still a futurity matter, though hopes are aroused that Honolulu's patience will be rewarded by the selection of the civic center idea, from and through which other building improvements depend.

A criminal wave of "high finance" has been the startling sensation of our little business world this year, by no less than three cases of embezzlement, all of them of large amounts, most of trust funds, by well-known men in full confidence of their respective employers, and a case of forgery. Other transactions of a shady nature were unearthed earlier, for which the author has left for other lands.

POLITICAL.

The primary elections for the counties other than Oahu took place in March. On Hawaii, four of the five general officers and one supervisor were elected outright, pointing to a republican victory. Maui and Kauai maintained their usual republican status. May 4th their general elections occurred, resulting in republican victories in all the islands.

At the special election July 8th on Oahu, for delegates to the Charter Convention, to convene Sept. 7th., less interest was manifest than was expected. Of the sixty-three delegates elected republicans largely predominated. The labors of the convention opened, as provided, with M. C. Pacheco, chairman, W. O. Smith, vice chairman, Jas. K. Jarrett, clerk, and W. J. Coelho, assistant. Several drafts of city charters were submitted for consideration, and also plans with various reports on the Commission form of city administration. The subject was assigned to a working committee of fifteen to consider and settle all differences to arrive at a workable form to suit our peculiar conditions for recommendation to the next legislature. Experience elsewhere on city government planning has profited by the advice of foremost experts in such matters. At least two forms came before this convention that had the careful attention of disinterested bodies of able men, seeking the highest welfare of the community, yet other drafts appear to have had preference of consideration which can show no such high aims, wasting valuable time of the committee by the insistence of their political sponsors, and threatening little or no improvement on what we already possess.

LEGISLATIVE.

Hawaii's eighth territorial legislature met according to law,

February 17th and promptly organized with Hon. C. F. Chillingworth as president of the Senate, and Hon. H. L. Holstein again speaker of the House. Governor Pinkham read his message in person in joint assembly. Experience in law making, as in other callings, was shown in the sixty days' work of the session, not only in the greater number of bills passed than on previous occasions, but with greater harmony between the two branches, as also lack of friction with the Executive, no vetoes being over-ridden on but three returned bills. Of the nearly five hundred bills introduced during the session two hundred and twenty-five became law, among the more important of which was the "workmen's compensation act", and a charter convention for Honolulu to recommend a new form of city government to the next legislature. Lest we glory unduly at this advancement, the "blot on the escutcheon" was its leaning toward further laxity of moral Sabbath restraint in letting down the bars for Sunday movies, as also the refusal of the house to purge itself of a morally disqualified member when it had the opportunity to establish a precedent on this important subject. The session got through its labors April 28th, and at a much less expense than the legislature of 1913.

An out-of-the-ordinary legislative routine was the wedding ceremony during the session of Hon. G. H. Huddy, member for Hilo, to Mrs. H. E. Sullivan, at a noon recess, at which the governor, fellow members, and a host of friends attended.

WEATHER CONDITIONS.

Weather observations since our last record have shown a peculiar year. Contrary to general expectations last winter's rains failed to average normal, January being light throughout the group, with several stations reporting no rain at all. February was but little better, but unusually cool, as was the preceding month, the temperature being below the average of the past ten years. The records will show colder snaps in earlier years, but not so long a spell of bracing weather.

Proverbial April showers helped conditions somewhat, the rains at most stations being above normal, with temperature of average range. May precipitations again fell short of the ten-year average, with a higher than average temperature through

the cessation of the regular trades, so that the spell of sultry weather beginning earlier was of course longer, and a warmer than usual summer. June was erratic, with better than usual rains on all the islands, accompanied with heavy thunder in several districts.

Conditions in summer told seriously upon Honolulu's water supply and forced attention to the needs of the city toward securing an adequate supply through additional sources to present system.

Since August (whose rainfall was below normal, and in many stations the least of any August record), conditions improved gradually up to the early part of November, when heavy rains set in which has been general throughout the group, and so severe in some sections as to cause much road and other damage. All indications point to a winter which will even up with its rain supply the deficiencies of several years past.

PUBLIC IMPROVEMENTS.

Much attention is being given to public works and improvements on the different islands, territorial and federal, with an outlook of "more to follow". Of local projects drawing to a close is the installation of an elevator of latest type and artistic finish in the executive building; reflooring the structure with ohia, and otherwise renovating the edifice. The judiciary building has also had attention, and the grounds are being recovered from a condition of long neglect.

The new prison, or Oahu penitentiary, of most modern type, in course of construction at lower Kalihi is progressing satisfactorily with prison labor, from plans of Ripley & Davis. The prison proper is over two-thirds completed, surrounding walls of concrete finished, with the administration building and bath house yet to be built. An artesian well has been sunk on the premises, securing a fine flow of water.

Kewalo's reclamation sanitation project was halted in 1914 on legal proceedings, but the work bids fair to be resumed shortly, liens according to law being all filed. An appropriation of \$32,000 was made for settlement of all claims against the work, which hardly meets the demands and will require time for adjustment, when plans for completion of the fill will likely

be made. The majority concerned hold the project as beneficial, and it is probable that upon its completion, that portion lying Waikiki from Ward avenue will be considered, property owners being in accord with the proposition, as it will enhance their land values.

A like reclamation sanitation project of the Waiolama swamp, of Hilo, that has long been under way has had final revision, and bids for the work have been submitted. The contract has recently been awarded to Lord & Young Co. on their bid of \$109,000.

The public works department also report considerable being done in homestead road work in various sections, and the stone embankment of the Waimea river, Kauai, completed at a cost of \$9,900. The new Territorial Marketing Division structure on Mauna Kea street, near Queen, is progressing favorably, planned to meet its special needs and prove the public convenience designed. The work will likely be completed by the close of the year, the contract price for which was \$10,100.

Hilo's breakwater is being extended steadily in spite of the distance from the quarry furnishing satisfactory rock for the work, and the several mishaps experienced, in consequence. The federal building of the "crescent city" is well under way and promises completion before even the site is settled upon for Honolulu's long-promised edifice.

Work upon the Pearl harbor dry dock was resumed last spring, and various other projects of the naval station are developing under the activities of a large force of mechanics.

EXTENSIVE COALING STATION.

Upon the recently acquired property of the Inter-Island Company, from the Dowsett estate, it is planned to erect a mammoth coaling station of most modern equipment to serve the needs of this "cross-roads" port of the Pacific for many years to come. Dredging is already in progress, and the contract for the plant signed, the construction to begin as early as the dredging permits. Piers are to be erected, with coaling berths to accommodate seven vessels at a time. The station is to have a capacity of 165,000 tons, with two unloading towers, each capable of handling 200 tons an hour. The concern is to be completed by

July, 1916, and will represent, it is said, an outlay of a million dollars.

BUILDING NOTES.

Building permits issued during 1914 for Honolulu amounted to \$1,317,580.50, covering value of new structures, alterations and repairs, and plumbing. For the ten months of 1915 ending with October the value of building permits, exclusive of plumbing, amounted to \$1,218,552, for 1068 permits issued. These figures do not include government work. This indicates an improvement over last year, in spite of disappointments and delays pending the settlement of the federal building site.

Among the prominent buildings in progress are noted, the memorial building of the Hawaiian Board, of brick, the cornerstone of which was laid July 17th., costing \$90,000; building and garage of the Schuman Co., of brick and reinforced concrete to cost \$75,000; the Star-Bulletin building, alteration and extension to three stories at \$46,348; Wm. Wolter's business block, with theater in the rear, on Union street with entrance also from Fort, to cost some \$75,000; the marketing division building, on Mauna Kea street, is in progress, to cost some \$10,000, and the new prison, in course of erection by prison labor, at lower Kalihi, for which \$150,000 has been appropriated.

Residences and cottages are still cropping up in various sections, in which Alewa and Pacific Heights both share, showing the tendency toward elevation sites.

New church buildings of the city are reported on elsewhere.

Activity prevails in marked degree in the military and naval quarters, that at Schofield Barracks including a concrete building to house the library secured through the personal effort of General W. H. Carter.

On the other islands a new residence is being built at Lihue, by Mr. G. N. Wilcox, costing \$20,000 and a fine two-story concrete fire-proof business block is planned, to serve for store, restaurant, photo gallery, offices and theater. Hilo is pushing forward its federal building and other improvements, and Wailuku among other changes is enlarging its hotel accommodations again. A new Haleakala rest house, with capacity for thirty,

has been built and fitted through the enterprise of Maui's public spirited citizens.

The Y. M. C. A. has added to its efficiency this summer, and the Y. W. C. A., having secured its old quarters from the Elks, it is having extensive alterations made therein to serve them as a future home.

A number of new school houses have been erected this year to meet the demands of our growing school population, though a large majority, while meeting a claim for tropical convenience, are not at all pretentious; giving the idea of a makeshift, rather than a permanent, provision for adequate school accommodation.

NEW CHURCH BUILDINGS.

The new Christian Church edifice erected on Kewalo street, near Lunalilo, was dedicated April 25th. on which congratulatory occasion two eminent divines from California came to assist its minister, D. C. Peters, and was joined in by the sister churches, Central Union and First Methodist of this city. This structure is of the bungalow type, quite a new departure in church architecture, but most appropriate in its setting. The building was completed at a cost of some \$40,000, after the plans of Messrs. Ripley and Webb, architects.

A new church building for the Epiphany Episcopal Mission at Kaimuki, a stone structure, was finished in June at a cost of \$4,650, Bishop Restarick conducting the dedicatory services.

The Korean colony is erecting a commodious church building on their Methodist training school premises, Punchbowl street, near Beretania, at a cost of nearly \$7,000.

REAL ESTATE CHANGES.

The real estate activities for the year are noted as embracing several transactions of magnitude, the foremost being of business properties that presage much for Honolulu's future. Toward the close of 1914 the Inter-Island Company obtained the valuable Anthon property, on Queen street, adjoining their ship-chandlery, for \$60,000, and during the past summer secured the Dowsett property, of some thirty-five acres, with its Kalihi channel frontage, for the sum of \$340,000, a transaction that had been long in progress.

Among other business district transfers is the Holt property, corner of King and Mauna Kea, with its one-story brick buildings, at \$60,000, and the Schumann Co. purchase of the Hawaiian Board property, corner of Merchant and Alakea, at \$45,000.

Tracts and lots for subdivision are: the Cooper properties in Manoa, the mansion to C. R. Frazier and balance to the H. Waterhouse Trust Co.; portion of the Uluniu tract, Waikiki, of some six acres, to P. M. Pond for \$32,500; the Stangenwald property on Nuuanu avenue to a Chinese syndicate for \$16,500. Many sales have been effected from the two first named, and a number of new homes already erected. The Howard tract, Makiki, has been divided into several lots, a portion of which was quickly taken. The Moana Hotel bought some 23 acres of adjacent Waikiki property for \$30,000; W. R. Castle secures nearly four acres of the Sherman tract, upper Nuuanu, at \$17,000. The Peck property, on Vineyard street, changed hands at \$22,000.

The foregoing may be taken as an index of the city's activities in real estate, taking into consideration the many homes and house lots transferred, yet we have the strange anomaly of many desirable improved properties being upon the market which are slow of sale at a decline of former values.

PLANTATION MATTERS.

Ever watchful for labor-saving and other improvements in cane culture and sugar manufacture, a number of our plantations have been testing several local inventions during the past season, which are giving promise of satisfactory results, reports on which at the approaching annual meeting of the Planters' Association will be looked for with interest. Among these practical testings may be noted the Ramsey macerating scraper and intermediate conveyor, installed in the Pioneer and Puunene Mills which has given much satisfaction, also, a new shredder, the invention of W. Searby, of Puunene, installed at Puunene, McBryde, Kahuku and Makaweli which is meeting expectations. The Hind-Renton improved grooved steel roller is said to be proving the success claimed for it.

The Honokaa Sugar Co. with its new first mill was enabled

to handle its own cane and that of the Pacific Sugar Mill in good season, both of which gave record crops.

Waianae Co. has enlarged its mill, evaporating plant, and building for same, in time for their 1916 crop, at an outlay of some \$80,000. The Maui Agricultural Co. also increases its capacity to 120 tons juice per hour by their new quadruple effect.

The changes of record during the year are that of the Kipahulu Plantation to Williamson and Fassoth, the latter assuming management, and the Kona Development Co. and its railroad interest, to a Japanese syndicate, with T. Konna as manager. The Hawaii Mill Co. also changes hands, its new owners being Ogg and Henderson. A new milling concern is establishing in Hilo to care for the cane plantings of Portuguese planters of the Kaiwiki district, the mill plant now being constructed by the Honolulu Iron Works Co. to be ready for its first crop in March next, of some 500 acres.

FIRE RECORD.

Honolulu has been favored with another year of comparative freedom from disastrous fires, the most serious being that of Dr. Grossman's fine new residence in upper Nuuanu, undergoing its finishing touches, April 25th, which was gutted by fire, possibly from spontaneous combustion. Loss about \$15,000. Another was that of the Schumann garage with a loss of some \$10,000. What threatened to be a serious affair was the fire on King street, opposite Kawaiahao church, during the lantern parade of Feb. 20th., but which was subdued by prompt action of the fire department, and a corps of militiamen.

There have been a few other minor fires. Our protection from more serious loss is due to the vigilance of the department, as the record shows just one hundred fire alarms responded to for the ten months ending with October.

Provision is made for the addition of three Seagrave combination engines and hose carriage at an expenditure of some \$30,000. These motor outfits will be of special service in hill climbing and long distance calls, and will reduce the number of horses heretofore maintained.

FATALITIES.

The startling fatality in the loss of the submarine F-4, on March 25th., off Honolulu harbor, is already told on page 131.

August 26th. an explosion occurred at the tanks of the Standard Oil Co., at Iwilei, from some unknown cause while men were engaged in their duties, resulting in the death of the superintendent, C. Eirich, foreman A. Schieber, and Ralph B. Harrub. All three victims were hurled into the air by the force of the blast, receiving such injuries that death ensued in from ten to thirty hours. Subsequent investigation attributed it to probable electric spark.

MARINE CASUALTIES.

Am.-Hawn. S.S. *Washington* with 8000 tons sugar, from Hilo for Philadelphia, was sunk in collision Jan. 25th. near the Delaware Breakwater by the schnr. *Elizabeth Turner*, which was also lost.

Schnr. *Defender*, after repairs through running ashore at Mahukona, Jan. 15th., met disaster again on being towed from this port for Hana, going ashore Feb. 1st. at Keamoku, Lanai. Several stmr. sent to her aid rescued her from a perilous situation and brought her to port on the 4th. for repairs.

Stmr. *Santa Maria* arrived in early February after a stormy passage from Port Harford, much battered and everything movable swept from the decks.

French bark *Francois d'Amboise*, coal laden from Newcastle for San Francisco, arrived here June 1st. with her cargo afire. Coming into port, some 1500 tons were taken out before the fire was extinguished. Reloading she resumed her voyage July 4th.

Schnr. *J. M. Weatherwax*, from Victoria with lumber for Sydney, put in here leaking June 24th. Sailing, she returned again in October in same condition, and at this writing is awaiting orders.

News was received here July 22nd. of the loss of the cable schnr. *Strathcona*, from Auckland for Honolulu, on the Minerva Reef. A portion of the crew was rescued, but one boat's crew have not been heard from.

Schnr. *O. M. Kellogg*, 393 tons, from Samoa for San Fran-

cisco, ran ashore on Maro Reef Sept 15th. and became a total loss. The Captain, his wife, officers and crew set out for Laysan Island in two boats, but had to abandon one on the way. Reaching there safely they sailed thence to Midway, where the Iroquois was sent to bring them to this port.

Through heavy weather, in February, the stmr. *Lowthian Castle*, from Japan, lost two propeller blades and put in here for repairs and bunker coal.

Chilean ship *Carelmapu*, which left Honolulu Oct. 19th for Port Townsend, was driven ashore in a heavy gale on the west coast of Vancouver island on the night of Nov. 25th and battered to pieces by the fury of the storm, and her whole crew of twenty-five men was lost.

VISIT OF TRAINING SHIPS.

Visits of training ships from the East and the West has been this year's experience, first in the arrival of the New York State training ship *Newport*, on a training cruise to these islands, arriving at Hilo from New York via Panama, July 3d. She had about 150 boys ranging from twelve to twenty years. Hilo gave them welcome, and during their stay visited the volcano where Madam Pele entertained them with her usual attractions. Thence to this port, arriving on the 7th, the Mayor and Committee from the Chamber of Commerce welcomed them and did them honors during their short stay. The vessel is barkentine rig, with steam auxiliary, and presented a fine appearance.

Sept. 20th. the Japanese four-masted training ship *Taisei Maru*, of 2000 tons, arrived from San Francisco on her way home, with her full complement of officers and 107 cadets. Both of these vessels held receptions that were very generally attended.

WIRELESS TELEPHONY.

Naval quarters at Pearl Harbor inaugurated the marvelous feat of long distance telephony by receiving a test message from the Arlington station, Virginia, a distance of nearly 5,000 miles, which was clearly understood, though the instruments here not being yet complete no reply was made. This test occurred Sept. 30th. following a series of experiments along these lines.

FOURTH CIVIC CONVENTION.

The idea of an annual convention of the Civic Bodies of the territory is growing in favor if we may judge by the attendance, interest and enthusiasm of the Fourth Annual Civic Convention held at Lihue, Kauai, Sept. 26 and 27, 1915. It is significant that civic righteousness was chosen as the central theme, and that there was a singular unanimity of emphasis on the constructive side, the opportunities and responsibilities of the good citizen rather than the failures and shortcomings of the public servant.

Such conventions cannot fail to leave beneficial results, if not always directly, at least indirectly in educational ways and the stimulation of fellowship and unity.

JAPANESE CORONATION OBSERVED.

The Japanese of this city celebrated the coronation of Emperor Yoshihito, November 10th. in a series of festivities, receptions and ceremonies, naturally characteristic of the race, lasting several days, culminating with a carnival at the consulate, Sunday afternoon, the 14th., at which an admission fee was charged, the event realizing over \$7,000, which sum will go toward the creation of an artistic fountain proposed to be erected in Kapiolani Park to commemorate the ascension of the emperor.

Wednesday, the eventful day, was observed at the consulate in the ceremonious reading of an address to the portrait of the emperor by Consul Arita, in the presence of a large assembly. This address was cabled to Japan the same day, and was later enclosed in a koa case and forwarded to the emperor. In the evening Consul and Mrs. Arita entertained at a formal reception at the Young Hotel, which was very generally attended, regardless of the inclement weather.

PAN-PACIFIC CLUB'S FLAG DAY.

Honolulu enjoyed a Flag Day exhibition Sept. 25th., under the auspices of the Pan-Pacific Club, illustrative of the community spirit in this "Crossroads of the Pacific" as a melting-pot of nationalities in which fourteen states and countries in and bordering on the Pacific participated, represented by companies

of young women and girls, in costume, bearing their respective colors. This picturesque event took place in the executive grounds, the procession of the various nationalities advancing with their flags to the steps of the building and presenting them to Queen Liliuokalani, who graciously received them on behalf of the club. These colors represented Australia, California, Canada, China, Hawaii, Japan, Korea, New Zealand, Oregon, Pan-America, Philippines, Portugal, Siberia and Washington.

In the evening the members of the club held a banquet in the gymnasium of the Y. M. C. A. which was gay with the day's flag decorations, indicative of the aloha spirit which pervades Hawaii towards all peoples. It was suggested that this date be observed annually hereafter as "Balboa Day", in commemoration of his discovery of the Pacific.

MUSICAL TREATS.

Rare enjoyment has been the portion of the music lovers of Honolulu during the year in the too brief visits of several celebrities of world-wide fame, as shown in the following brief record:

In April Miss Felice Lyne, the American prima donna, gave two delightful concerts at the Opera House, in which she won the hearts of her fortunate hearers. It was said: "We had heard singers with greater fame, more heralded and better known, but never a more perfect queen of song". Her second and closing entertainment literally packed the house, which was enthusiastic and appreciative.

Following this song-bird was the Bevani Opera Company for a season at the Bijou, in which were several artists of note that won recognition despite opening disadvantages. Those appreciative of grand opera would have enjoyed a season of this company at the Opera House, where the artists would have felt more in their element.

Mme. Foret, a chanson singer, gave two entertainments at the Opera House of folk-songs.

Harold Gregson, and Walter H. Thorley, noted organists, both gave several recitals on the organ of St. Andrew's cathedral during their visits.

Mme. Melba favored Honolulu with a short stay, en route from the Colonies on her American-Canadian tour, and gave two

concerts at the Opera House while here, assisted by Robt. Parker, baritone, and Frank St. Leger, pianist, forming a strong trio which packed the house on both occasions. The famous diva charmed her audiences here, as elsewhere, with her melodious voice and her gracious manner which won all hearts to enthusiasm.

The Cherniavsky Brothers, three Russian musicians, evincing rare talent on violin, cello, and piano, gave four concerts during their visit in September, charming full houses on each occasion with their exquisite rendition of classic masterpieces.

At this writing is announced a song recital by Miss Inga Orner, a famous Norwegian prima donna from the Metropolitan Opera Co., New York, and the Covent Garden, London, which is looked forward to with keen anticipation.

TEMPERANCE NOTES.

Temperance workers have been much strengthened in their purpose by the visit, in February last, of Dr. P. A. Baker, the national superintendent of the Anti-Saloon League of America, by his stirring addresses and reports of mainland progress. Dr. Wadman's work in organizing the Lincoln-Lee Legion (numbering now some 5,000) among the young people throughout the islands, spoke for itself in the convention exercises February 28th. at the executive grounds, following gatherings at Thomas Square and Kaumakapili.

Through the activity of the Anti-Saloon League, in early summer, the air was clarified of several questionable saloon-brewery business transactions, closing two saloons and restricting the retailing area.

VOLCANO NOTES.

Mokuaweoweo broke out for a short period of activity Dec. 14, 1914, and the year 1915 opened with both Kilauea and the summit crater in rival action, the latter gradually subsiding. Phenomenal changes have marked the eccentricities of Kilauea during the year, including intervals of "freezing over" and maintaining a record of deep interest for scientific observation. In April, lava streaming, avalanches and explosions were marked features, and at the visit of the Congressional party, in May,

Madam Pele's coquetry duly impressed them. Subsidence was a noted feature in August, from which it recovered and developed a series of changes that grew in intensity by the opening of November. The increased number of visitors this year is evidence of the growing interest in our volcano.

While preparations were being made for the photographing of Halemaumau from a cradle swung over the pit mouth, in April last, the cable broke and fell into the molten lava, fortunately before it had come into actual use. This cable was planned to carry a moving picture operator on a sliding noose down the loop, but the foolhardy venture was timely thwarted by the unlooked-for accident, while the operator witnessed it from the brink of the crater and thanked his stars at his escape from what would have been the first fatality at the volcano.

MAUNA LOA TRAIL.

A trail to the summit crater of Mauna Loa is in prospect, the first section of which has been recently located. This will run from the Keauhou Ranch to Puu Ulaula on the north-east slope of Mauna Loa, an eminence observable from the Volcano house, distant some sixteen miles, the road over which may be readily constructed without difficulty to this intermediate site. The lower half of the trail runs through forest, above this is some eight miles through scrub ohia, after which is open country. Engineer A. L. Burdick, of the Public Works Department, with the veteran guide, P. K. Pea, of Puna, located this section, and in aid of the project a company of the federal troops have volunteered for the construction work.

NEW POLO FIELD.

Interest in polo has so far developed, through the annual inter-island contests, that steps are taken to secure a portion of Kapiolani Park for preparation for future meets, and the erection of grand stand, bleachers, and other accessories for the convenience of poloists and the public in general.

DEEP-SEA FISHING.

Much interest is being evoked by several deep-sea fishing enthusiasts in the opportunities afforded in Hawaiian waters for the prosecution of this rare and enjoyable sport. A party

of local experts have from time to time verified this claim by returning from the off-shore grounds loaded with trophies of the finny chase, and visiting sportsmen have likewise enthused over the exciting experiences off Honolulu, Pearl Harbor, and other localities in the varieties and size of the game fish of Hawaiian waters. An Association has been formed under the name of the "Hawaiian Tuna Club," the object of which shall be for the higher development of the art of angling, and the protection of the game fish of the Hawaiian Islands.

IMPROVING STOCK.

Several importations for stock improvement is noted again this year, indicative of the aim of our ranches for higher grade stock. These importations embrace sheep, hogs and horses. The Parker ranch procured from New Zealand fifty pure bred Merino rams, also ten Shropshire and fifty-eight Delaine Merino rams from Oregon, for their Humuula and Keomoku stations. A number of fine brood mares were recently received from the coast for Maui parties. On this island more attention to hog raising on scientific principles is being tried, for the supply of local needs, since the market calls for over 100,000 hogs per annum. In August last there was a shipment of 800 from Yakima.

IN MEMORIAM.

Among the larger number than usual year's record of well known residents who have been called hence are several whose labors have endeared them in the hearts of many throughout the islands, among whom are the following:

Rev. Wm. Brewster Oleson, whose sudden death in Arizona, while on a vacation journey, closes a life that enriched Hawaii and its people through his conscientious work for their highest interests. As principal of the Hilo Boys' School, and called to establish the Kamehameha Manual of this city, which he directed for several years, he proved his marked administrative ability, and gave this latter an impress and recognized standard which it has since maintained. Returning to the states he enjoyed a successful pastorate for a number of years, and on revisiting the scene of his educational labors he was induced to

accept the secretaryship of the Hawaiian Board, a service in which he was in deep sympathy for the upbuilding of the native churches throughout the islands. And his labors have not been in vain.

In the death of Chas. R. Bishop, Hawaii and her people lose the most liberal philanthropist she ever knew. Coming to the islands on the eve of the whaling industry activity he became early identified with the commercial interests and development of the land of his adoption, and as a friend of education aided materially in shaping its educational policies. As fortune smiled upon him he gave back to the country of the wealth he earned therein over two and a quarter millions of dollars in educational, religious and scientific buildings and equipment for the benefit of present and future generations. A worthy tribute to the home life of this devoted friend of Hawaii appears elsewhere.

Francis Williams Damon, after a long season incapacitated through strenuous devotion to the religious and educational up-building of the Asiatics in these islands has been called to his reward. In championing the Chinese work, a legacy from his father Dr. S. C. Damon, he worked cheerily against prejudice, superstition and ignorance, and lived long enough to break down these barriers and rejoiced at the auspicious opening of the Mills Mid-Pacific Institute, the growth from his handful of students in 1892. His interest and identity with the Fort street Chinese church was also as marked, and in the establishment of the kindergarten schools he gave them enthusiastic support. He was the advocate of Aala park as a breathing spot and play ground for the children in that section of the city. What was but a mud flat at that time has become a pleasant and popular recreation ground. The memorials therefore to his memory were widespread and heartfelt.

By the death of Dr. N .B. Emerson, Hawaii loses another son of the early mission band who devoted his talents in her interest; cut off in the midst of his labors. His intimacy with the native language and people led him, in the spare hours of his profession, to seek to rescue from oblivion the stored gems of their ancient meles, of which he had gathered a large collection, and to the interpretation of which he gave close study for many years past, to unearth their hidden meaning.

MEMORIALS.

A bronze bas-relief memorial to the memory of the late Dr. W. R. Brinckerhoff was placed in St. Andrew's Cathedral early in the year, a beautiful work of art by John M. Rhind, a Scotch sculptor, of New York. It is some five feet in height, depicting Christ blessing the physician.

The Territory is in receipt of a bronze plaque from the officials of the Panama-Pacific International Exposition to commemorate the dedication of its Exposition building.

Bronze tablets have been placed in Kawaiahao church to the memory of Rev. H. Bingham and wife, and also to Rev. B. W., and Mrs. M. E. Parker, and in Kaumakapili church a like testimonial is placed in memory of Rev. M. K. Nakuina by the Christian Endeavor societies of which he was long their efficient leader.

NECROLOGY.

Again has the grim reaper's sickle laid low an unusually large number of well known, or early residents, many of them from lives of usefulness beyond their immediate sphere, though the proportion of fully ripe sheaves is beyond the annual average. Among the large list appear the following: Rev. Dr. W. P. Ferguson (52), Mrs. M. C. Needham (81), John T. Campbell, Cal. (58), J. K. Sumner (94), Chas. K. Maguire (37), John Cassidy (70), P. McInerny (79), Mark P. Robinson (62), Capt. I. Bray (70), Rev. W. B. Oleson (63), A. T. Wakefield (37), Mrs. S. L. Austin (79), J. O. Lutted (71), Peter High (79), Mrs. J. M. Peterson (85), Robt. W. Catheart (59), Lt. C. K. Lyman, F. F. Fyler (71), J. C. Quinn (48), W. W. Kirkland, Cal. (76), Wm. Kinney, Hilo (78), Chas. R. Bishop, Cal. (93), Mrs. C. E. Godfrey, Cal. (58), Mrs. M. M. Little (84), F. W. Damon (62), Dr. P. W. Frear (45), Mrs. C. A. Babcock (81), Mrs. F. M. Simpson (65), Mrs. D. W. Corbett, N. Y., Major H. N. Benson, Cal., Dr. N. B. Emerson (76), C. S. Holloway (41), Judge J. Hardy, Lihue (88), Mrs. M. Creighton (79), J. H. Boyd (56), C. Meinecke (72), Mrs. J. Wight, Kohala (90), Miss M. J. Alexander, Cal. (73), Mrs. L. B. Coan (80), W. L. Maertens, Germany (74), Capt. R. F. Bennett (49), Arthur Harrison, Cal. (68), Mrs. S. M. Lack

(80), J. J. Carden (69), Mrs. F. D. Walker (71), J. A. Hogg, Lihue (51), A. E. Murphy (54), Mrs. P. P. Sheperd (79), A. D. Bolster (78), H. C. Meyers (66), Geo. H. Williams, Hilo (62).

THE WAIAHOLE TUNNEL PROJECT

[Revised from the "P. C. Advertiser" of July 4, and Nov. 7, 1915, with later official data.]

PUBLIC interest has been manifest to an unusual degree from the outset of this engineering project of tunneling the Koolau mountain range to convey the Waiahole waters of Waikane and its vicinity to the upper cane lands of the Oahu Plantation in the Ewa district, and justly so, not only for the vastness of the scheme and benefits to be derived therefrom, but also the surprises and difficulties met with and surmounted in the progress of the undertaking.

The work was inaugurated from both sides of the range, simultaneously, in the early part of 1913, and was prosecuted with vigor till summer, when the unexpected development of water of large volume in the tunneling operations interrupted the work. It was about this period that Engineer Jorgen Jorgensen, who had carried through several important irrigation works on the windward islands, notably the Nahiku project on Maui, and the Kohala ditch, as also the Hamakua schemes, on Hawaii, took charge of the work.

This project contemplated a main bore tunnel of eight by seven and a half feet through the mountain, 14,443 feet, or 2 19-26 miles, with a series of some twenty-seven feeding laterals on the windward side, of a total length of 26,201 feet, and thirteen distributing laterals on the leeward, or southern side, of a total length of 19,211 feet.

To better understand this irrigation project one must follow the account in detail of its development for a realization of the difficulties that have been encountered and overcome, which is as follows:

"When the contracting engineer of the great Waiahole water project began driving his tunnel into the mountain backbone of

Oahu he began to establish records in tunnel work, and he has kept on making them. When, in the month of September, 1914, he drove the eight by seven and a half foot face forward 655 feet, he not only broke all Hawaiian records but he set a new mark for all America. In June, when that same face only advanced some sixty feet, he also established a record, not only for America, but for the world, because that distance was made in the face of difficulties unique in mining history.

"The progress record for America, up to this time was held by the contractor for the great Los Angeles aqueduct, whose men made 649 feet in one month of thirty days in driving the Elizabeth tunnel. That record was made in limestone, an easier breaking rock than the tough lava into which the Jorgensen miners drove their 655 feet, which fact adds all the more to the credit of the Oahu miners.

"Engineer Jorgensen's latest record is in driving ahead in a tunnel through which is racing a flood of water amounting to sixteen million gallons every twenty-four hours, a fair-sized creek. Through this flood, swiftly flowing the length of the tunnel and, until the opening of July, foaming out like the discharge of a millrace into an up-country valley, the miners forced their way with their tools, and the supplies of steel and powder were taken for well over two miles. Through this flood, more than two feet deep and swiftly flowing, tracks were laid for the muck cars, the cable furnishing the transportation power was carried forward and installed, the pipes for the compressed air for the drills were extended and the electric wiring installed.

"For the last three hundred feet the tunnel was a whirling rainstorm, a giant shower bath, a waterspout and a typhoon combined. From sides, roof and face the water spurted in continuous streams, in some instances with a force against which one could not stand. As the airdrills bit into the lavas new streams developed. When necessary to change the steel drills the jets from the drill holes were frequently such that one man could not drive the steel bars in against them, it required two or three husky miners to force the drills into the holes and hold them there until the air was applied.

"Into these drill holes the dynamite could not be tamped in

the ordinary way. The common dynamite stick was torn up and spat out by the flood, so a novel method of loading evolved. Tin cylinders, made to hold ten sticks of giant powder each were prepared, the dynamite unwrapped and jammed into the tins, fused and capped. Then the cylinders were driven against the water into the drill holes and there wedged. It was an uncanny method of using dynamite, but, like a lot of other things being done in the Waiahole work, the only possible way.

"Never in mining history has the attempt ever been made to tunnel through such a river bed, the tremendous difficulties of handling everything necessary in and out of a tunnel well over two miles deep, every foot of which is a swirling torrent, being appreciable only to one who has waded that last hundred yards of the main tunnel being driven from the south side of the Koolau range to meet the main tunnel now boring its way from the north side of the range.

"Up to July 3rd this water flow of sixteen million gallons was running to waste down the kukui-lined gulch and to the sea. Preparations to handle it had not been made, inasmuch as it had not been anticipated that such a flow would be struck. The miners broke into the water-carrying strata all in one blast. With the appearance of this water, work on the face was stopped, and the whole working force was put on completing the tunnel already driven, concreting the bottom to make it watertight, also the roof in many places, lining the sides with masonry work where the formation was loose and seamy, and plastering the same. Then the remaining prepared charges were fired and the water, stored up in the mountain depths, poured out. In the meanwhile work had been going on on the miles of side tunnels, driven to carry the water from the main tunnel to the highlands of the Oahu Plantation. July 3d, the first water flowed through these 19,211 feet, made up of thirteen tunnels, and on to the Waiawa lands of the plantation, reaching the sunlight some 710 feet above the sea, a height of 160 feet above the highest points to which the great pumps of the plantation system have ever been able to deliver water profitably.

"The development of this subterranean supply, however embarrassing it has been to the contractor, is therefore a boon to

the Oahu Plantation, which thus received a portion of its new water supply well ahead of expectations.

"The Waiahole water project is one whereby a daily supply of up to one hundred and twenty-five million gallons of water is to be delivered from the windward side of this island to the Oahu Plantation on the lee side of the island. To gather the water, on the north side of the mountain range, a series of twenty-seven tunnels are being completed, with a total length of 24,646 feet.

"On the south side of the mountain, to carry the water from the main tunnels to the upper lands of the plantation, a series of thirteen tunnels were necessary, together with open ditches aggregating 18,644 feet. These tunnels are completed, lined with concrete and ready, and the ditch system is nearing its completion. The main tunnel will be 14,443 feet, driven clear through the mountain range.

"In the south portal, where the records have been broken and from which the water is today being delivered to the plantation, the real big work has been going on. This tunnel reached a depth, as of July 1st last, of 10,723 feet, of which the last 350 was driven through a subterranean river. Of the main tunnel, at that date, between the ends of the north and south portals, there were 2,020 feet of tough lava, every foot of the way being a spillway for the rainclouds far overhead, which keep the mountain peaks dripping jungles, seeping their waters into the deep down reservoirs the tunnels are tapping. In the progress of this work, driving ten feet a day from the north and five feet a day from the south brought the tunnel faces fifteen feet closer to each other every twenty-four hours.

"Within a short time now, probably before the close of the year, the two tunnels being bored into the mountain backbone of the island, from Waiahole, on the windward side, and from Waiawa on the Honolulu side, will meet and one of the most difficult Hawaiian tunneling propositions will be accomplished.

"Last mid-summer the obstacles put in the way of the contracting engineer seemed almost insuperable. Wholly unexpected water basins had been tapped by the airdrills in the face of each tunnel. In the south portal, on the lower side of the great bore, a veritable millrace was encountered, millions of gallons

of water spurting daily from face, roof and floor of the tunnel. In the north portal, which was being driven with a down grade of two feet in the thousand, the water filled the lower level and drowned out the workmen, coming in such quantities that the two great siphons installed were unable to handle it and the working capacity of the bore prohibited the installation of more drainage pipes.

"But, despite the tremendous difficulties, difficulties which visiting engineers marvelled over, the work was continued until now the miners driving in from the north and those burrowing and blasting from the south are so close that the blasting in one tunnel can be felt in the other. During the month of October the tunnels were driven ahead 452 feet, leaving 470, when the tunnel will be through, under the mountain, from one side of the island to the other.

"When the final blast tears down the lava barrier between the faces of the two tunnels, the most ambitious water project yet attempted in the Territory will be practically completed, as the work on the many miles of side tunnels and water ditches is also rapidly nearing completion and very little will be left to do when the main tunnel has been completed. On the Waiahole side, the intake end of the irrigation system, some twenty-seven tunnels have been driven through the mountain spurs as far west as Kahana, the total length of these tunnels being 26,201 feet. These are connected up by concreted ditches and the tunnels themselves have been concreted to prevent seepage waste.

"On the south, the delivery end of the project, thirteen tunnels, with a combined length of 19,211 feet, are finished, designed to convey the flow of the main bore and carry it to the west, where it is turned into a series of concrete-lined ditches and great steel siphons, to be delivered on to the thirsty land of the Oahu Plantation at an elevation of 700 feet. These ditches and siphons carry the water for 21,000 feet across country and up and down the gulches.

The feeding system on the Kahana side gathers up the waters of twenty streams, and develops underground water sources with an aggregate flow of between four and five million gallons a day. The low water run through these feeding tunnels is estimated to

be thirty-five million gallons each twenty-four hours, which during the periods when the season's rains swell the Kahana run-off, the ditches and tunnels are expected to run to full capacity, which means that one hundred and twenty-five million gallons will pour into the field ditches after traversing the passage dynamited for them through the range.

"The work in the south portal was made difficult because of the water that drenched everything and which raced from tunnel face to mouth, almost carrying the miners off their feet, but this was the worst. The tunnel sloping towards the mouth, drained itself, and fortunately, the delivery system on the plantation side had been so nearly completed when the big flow was struck that the unexpected water, amounting to many millions of gallons a day, could be made use of by the plantation.

"The disposition of the water struck in the north portal was a difficult proposition. That tunnel slopes from mouth to face, the water flowing into the tunnel and drowning out the miners. When the huge siphons proved inadequate to handle the flow, heroic measures were found necessary. These consisted of driving another tunnel, fifty feet to one side of and sixteen feet above and almost parallel to the main workings, the essential difference being that this tunnel was given an upward incline. Then, seventeen hundred feet in the main tunnel a huge centrifugal pump was installed, having a capacity of twelve million gallons a day, and with this pump the accumulating waters were lifted into the drainage tunnel and allowed to drain out of the way. The sight of the great pump, thumping away at work deep in the bowels of the earth was one of the many interesting things to be seen in the progress of the Waiahole project.

"The water thus pumped and drained from the north tunnel at such expense was not allowed to escape without performing its share of the general work, however. Before escaping into the Waiahole gulch and on to the sea, the water was conducted through a 1,400-foot penstock and against the flanges of a Pelton wheel, where it developed 360 horsepower, converted by means of a 250-kilowat dynamo into 2,300 volts of electrical energy, and this electrical power ran the machinery and furnished the light not only for the further work of the north portal but for

the south portal as well. The 2,300 volts, by transformers, were stepped up to 11,000 and carried by wire over the crest of the great pali and down the south mountain slope, where transformers again interposed and stepped down the current to one of 440 volts, to run the motors.

"Mr. Jorgensen, who entered upon this contract on the eve of various outbreaks of trouble, has been carrying a really stupendous work along without much publicity and with little realization on the part of the general public that within a few miles of Honolulu one of the greatest tunneling works ever undertaken by any engineer was being carried on. Not only have railroads been run up—literally up—the mountainsides from near sea level to the two main tunnel mouths, but massive machinery has been carried up and installed in gulch and on mountainside and deep underground and all the available forces of nature have been put to work to help in the main object, that of collecting the surface and subterranean waters on one side of the island and leading them miles underground on to the cane fields of the leeward levels. When the two main tunnels become one, which will happen within a few days now, a big feat will have been accomplished."

THE "*Garden Island*" this past year has made public a series of local reminiscent contributions, being papers of the Kauai Historical Society, and comprised: Lihue, by Mrs. W. H. Rice, Jr.; Koloa, by Hon. W. O. Smith and Rev. J. M. Lydgate, as also Wailua, by Judge Lyle Dickey. Hawaii and Maui journals might do like service to perpetuate the memories of historic interest of their older residents. We venture the opinion that such subjects as Early Recollections of Hilo; Historic Kailua; Kawaihae in its palmy days; Lahaina's period of political and commercial supremacy; East Maui, the cradle of Hawaiian farming effort, and other points that might be named, would prove of interest to present-day readers, and valuable for reference in years to come.

List of Sugar Plantations, Mills and Cane Growers Throughout the Islands.

Those marked with an asterisk (*) are planters only; those marked with a dagger (†) are mills only; all others are plantations complete, owning their own mills. (Corrected to November 15, 1915.)

Name.	Location.	Manager.	Agents.
Apokaa Sugar Co.*	Ewa, Oahu	G. F. Renton	Castle & Cooke, Ltd.
Ewa Plantation	Ewa, Oahu	G. F. Renton	Castle & Cooke, Ltd.
Gay & Robinson	Makaweli, Kauai	S. Robinson	H. Waterhouse Trust Co., Ltd.
Grove Farm*	Nawiliwili, Kauai	Edwin Broadbent	H. Hackfeld & Co., Ltd.
Hakalau Plantation Co.	Hilo, Hawaii	J. M. Ross	C. Brewer & Co., Ltd.
Halawa Sugar Co.	Kohala, Hawaii	H. H. Perry	T. H. Davies & Co., Ltd.
Hamakua Mill Co.	Hamakua, Hawaii	A. Lidgate	T. H. Davies & Co., Ltd.
Hawi Mill and Plantation Co.	Kohala, Hawaii	John Hind	Hind, Ralph & Co.,
Hawaiian Agricultural Co.	Kau, Hawaii	W. G. Ogg	C. Brewer & Co., Ltd.
Hawaiian Commercial & Sugar Co.	Puunene, Maui	F. F. Baldwin	Alexander & Baldwin, Ltd.
Hawaiian Sugar Co.	Makaweli, Kauai	B. D. Baldwin	Alexander & Baldwin, Ltd.
Hawaii Mill Co.†	Hilo, Hawaii	Jas. Henderson	
Hilo Sugar Co.	Hilo, Hawaii	John A. Scott	C. Brewer & Co., Ltd.
Honolulu Plantation Co.	Halawa, Oahu	Jas. Gibb	C. Brewer & Co., Ltd.
Honokaa Sugar Co.	Hamakua, Hawaii	Alexr. Morrison	F. A. Schaefer & Co., Ltd.
Honomu Sugar Co.	Hilo, Hawaii	Wm. Pullar	C. Brewer & Co., Ltd.
Hutchinson Sugar Plantation Co.	Kau, Hawaii	Geo. Gibb	C. Brewer & Co., Ltd.
Kaeleku Sugar Co.	Hana, Maui	J. Chalmers	T. H. Davies & Co., Ltd.
Kahuku Plantation	Kahuku, Oahu	Andrew Adams	Alexander & Baldwin, Ltd.
Kaiwiki Sugar Co.	Ookala, Hawaii	Jas. Johnston	T. H. Davies & Co., Ltd.
Kaiwiki Milling Co.†	Hilo, Hawaii	H. P. Faye	H. Hackfeld & Co., Ltd.
Kekaha Sugar Co.	Kekaha, Kauai	J. R. Myers	C. Brewer & Co., Ltd.
Kilauea Sugar Plantation Co.	Kilauea, Kauai	J. Fassoth	H. Hackfeld & Co., Ltd.
Kipahulu Sugar Co.	Kipahulu, Maui	Geo. C. Watt	Castle & Cooke, Ltd.
Kohala Sugar Co.	Kohala, Hawaii		

List of Sugar Plantations, Mills and Cane Growers Throughout the Islands.—Continued.

Name.	Location.	Manager.	Agents.
Koloa Sugar Co.	Koloa, Kauai	E. Cropp	H. Hackfeld & Co., Ltd.
Kona Development Co.	Kona, Hawaii	T. Konna	H. Waterhouse Trust Co., Ltd.
Koolau Agricultural Co.*	Koolau, Oahu	Andrew Adams	Alexander & Baldwin, Ltd.
Kukaiau Mill Co. [†]	Hamakua, Hawaii	J. McLennan	T. H. Davies & Co., Ltd.
Kukaiau Plantation Co.	Hamakua, Hawaii	J. McLennan	T. H. Davies & Co., Ltd.
Laike Plantation	Laie, Oahu	J. McLennan	Alexander & Baldwin, Ltd.
Laupahoehoe Sugar Co.	Laupahoehoe, Haw	S. E. Wooley	T. H. Davies & Co., Ltd.
Lihue Plantation Co.	Lihue, Kauai	C. McLennan	H. Hackfeld & Co., Ltd.
Makee Sugar Co.	Kealia, Kauai	F. Weber	H. Hackfeld & Co., Ltd.
Maui Agricultural Co.	Haiku, etc., Maui	G. P. Wilcox	G. P. Wilcox
McBryde Sugar Co.	Wahiawa, Kauai	H. A. Baldwin	Alexander & Baldwin, Ltd.
Niulii Mill & Plantation	Kohala, Hawaii	F. A. Alexander	Alexander & Baldwin, Ltd.
Oahu Sugar Co.	Waipahu, Oahu	Robert Hall	T. H. Davies & Co., Ltd.
Olaa Sugar Co.	Olaa, Hawaii	E. K. Bull	H. Hackfeld & Co., Ltd.
Olowalu Sugar Co.	Olowalu, Maui	C. F. Eckart	Bishop & Co.
Onomea Sugar Co.	Hilo, Hawaii	Alexr. Valentine	C. Brewer & Co., Ltd.
Paaahu Sugar Plantation Co.	Hamakua, Hawaii	John T. Moir	C. Brewer & Co., Ltd.
Pacific Mill ([†])	Hamakua, Hawaii	Jas. Campsie	C. Brewer & Co., Ltd.
Pepeekeo Sugar Co.	Hilo, Hawaii	Alexr. Morrison	F. A. Schaefer & Co., Ltd.
Pioneer Mill Co., Ltd.	Lahaina, Maui	Jas. Webster	C. Brewer & Co., Ltd.
Puakea Plantation Co.	Kohala, Hawaii	L. Weinzheimer	H. Hackfeld & Co., Ltd.
Union Mill Co.	Kohala, Hawaii	H. R. Bryant	H. Waterhouse Trust Co., Ltd.
Waiakea Mill Co.	Hilo, Hawaii	H. H. Renton	T. H. Davies & Co., Ltd.
Waialua Agricultural Co.	Waialua, Oahu	D. Forbes	T. H. Davies & Co., Ltd.
Waianae Plantation	Waianae, Oahu	W. W. Goodale	Castle & Cooke, Ltd.
Wailuku Sugar Co.	Wailuku, Maui	Fred. Meyer	J. M. Dowsett
Waimanao Sugar Co.	Waimanao, Oahu	H. B. Penhallow	C. Brewer & Co., Ltd.
Waimea Sugar Mill Co.	Waimea, Kauai	Geo. Chalmers	C. Brewer & Co., Ltd.
		G. R. Ewart, Jr	H. Hackfeld & Co., Ltd.

HAWAIIAN SUGAR CROPS, IN TONS, 1910-15.

From Tables Prepared for Hawaiian Planters' Association by its Bureau of Labor and Statistics.

(Official figures for 1915 not available as these forms close.)

Prior years of this table, originating in 1891, will be found in Annuals since 1901.

Islands.	1910	1911	1912	1913	1914	1915
Production of Hawaii	159,856	193,456	209,920	197,415	217,654	240,307
" " Maui	139,454	139,564	248,585	124,819	144,940	160,254
" " Oahu	128,648	133,133	139,712	124,228	133,560	129,201
" " Kauai	90,169	100,668	97,041	100,336	120,884	115,890
Grand Total.....	518,127	566,821	595,258	546,798	617,038	645,652
<hr/>						
Hawaii Plantations.						
Waiakea Mill Co....	10,424	13,365	14,332	13,076	14,922	17,428
Hawaii Mill Co.....	2,313	2,917	2,378	2,855	3,601	3,795
Hilo Sugar Co.....	12,568	12,301	13,872	14,033	18,937	17,938
Onomea Sugar Co....	12,843	16,230	17,454	16,887	19,600	21,320
Pepeekeo Sugar Co..	7,012	7,925	8,009	8,951	9,806	11,448
Honomu Sugar Co....	6,541	7,293	7,450	7,004	8,567	9,850
Hakalau Plant. Co....	11,905	14,157	17,116	15,402	16,863	19,340
Laupahoehoe Sgr. Co.	7,970	8,058	9,087	9,671	11,193	11,730
Kaiwiki Sugar Co....	*2,134	5,010	5,896	5,140	6,932	6,574
Kukaiau Plant. Co....	1,037	2,662	2,021	2,078)	
Kukaiau Mill Co.....	1,728	1,774	1,347	1,385	3,225	4,672
Hamakua Mill Co....	5,526	7,262	9,461	6,845	7,057	9,233
Paauhau S. Plant. Co.	7,493	8,411	11,391	9,958	10,767	10,073
Honokaa Sugar Co....	7,562	9,134	8,259	10,103	7,272	8,612
Pacific Sugar Mill....	5,055	7,499	7,001	5,938	6,250	7,253
Niulii Mill and Plant.	2,231	2,648	2,014	2,803	2,700	2,200
Halawa Plantation...	1,679	1,667	1,902	1,641	2,087	2,576
Kohala Sugar Co.....	4,662	5,924	5,979	5,675	4,475	7,600
Union Mill Co.....	1,811	3,022	3,990	1,769	2,608	3,674
Hawi Mill and Plant..	6,881	7,715	9,453	6,489	6,745	8,790
Kona Developm't Co.	1,589	2,333	2,570	2,943	3,477	3,568
Hutchinson S. Pl. Co.	6,580	6,659	8,002	5,510	5,909	5,381
Hawaiian Agrl. Co....	11,003	13,775	14,938	12,856	17,890	16,232
Puakea Plantation....	1,474	1,094	1,538	839	1,035	1,400
Olaa Sugar Co.....)						
Puna Sugar Co.....	19,483	24,026	22,941	27,399	25,736	29,120
Puako Plantation....	352	595	519	185	.....	.....
	159,856	193,456	209,920	197,415	217,654	240,307

* Formerly Ookala Sugar Plantation Co.

HAWAIIAN SUGAR CROPS, 1910-15—Continued.

Maui Plantations.	1910	1911	1912	1913	1914	1915
Kipahulu Sugar Co..	2,046	2,193	2,197	1,408	2,126	2,705
Kaeleku Plant. Co....	5,221	4,492	4,949	4,938	6,225	6,605
Maui Agri. Co.....	29,295	30,765	34,612	24,633	33,660	39,620
Hawn. Coml. & S. Co.	56,865	55,050	60,010	50,310	56,500	56,780
Wailuku Sugar Co....	16,932	16,197	16,775	13,988	16,100	19,140
Olowalu Co.	1,796	1,693	1,707	1,738	2,027	2,175
Pioneer Mill Co., Ltd.	27,299	29,174	28,335	27,804	28,302	33,229
	139,454	139,564	148,585	124,819	144,940	160,254
Oahu Plantations.						
Waimanalo Sgr. Co..	3,845	4,962	4,979	4,287	5,133	5,300
Laie Plantation	1,170	784	1,200	977	1,600	1,162
Kahuku Plant. Co....	5,566	5,686	6,024	6,215	8,193	7,800
Waialua Agrl. Co....	30,870	32,271	33,356	29,751	30,298	31,156
Waianae Co.	6,614	7,124	6,021	5,226	3,083	4,971
Ewa Plantation Co....	31,422	31,206	34,435	29,512	29,563	30,126
Apokaa Sugar Co....	902	453	895	381	925	356
Oahu Sugar Co.....	29,296	33,243	33,472	28,142	33,474	29,610
Honolulu Plant. Co..	18,373	17,143	18,692	19,337	20,154	18,233
Koolau Agrl. Co.....	590	261	638	400	1,137	487
	128,648	133,133	139,712	124,228	133,560	129,201
Kauai Plantations.						
Kilauea S. Plant. Co.	4,102	5,471	5,543	5,451	6,426	6,740
Makee Sugar Co.....	5,823	4,168	5,219	7,418	10,660	10,820
Lihue Plantation Co.	14,765	17,740	18,021	19,819	22,065	20,158
Grove Farm Plntn....	3,673	3,724	3,098	3,695	4,415	5,342
Koloa Sugar Co....	7,709	8,960	8,005	5,886	8,572	9,502
McBryde Sugar Co....	10,596	14,073	13,147	14,509	16,345	15,458
Hawaiian Sugar Co..	23,422	24,975	22,221	22,308	26,826	24,754
Gay & Robinson.....	3,223	4,684	4,659	4,821	5,172	5,295
Waimea Sgr. Mill Co.	1,906	1,860	1,922	1,610	2,258	1,215
Kekaha Sugar Co....	14,124	14,185	14,348	14,008	17,153	15,878
Estate of V. Knudsen	826	828	858	811	992	728
Total.....	90,169	100,668	97,041	100,336	120,884	115,890

TERRITORIAL REGISTER AND DIRECTORY FOR 1916.

Corrected to November 29, 1915.

TERRITORIAL OFFICIALS.

Lucius E. Pinkham.....	Governor
W. W. Thayer.....	Secretary
I. M. Stainback.....	Attorney General
C. J. McCarthy.....	Treasurer
C. R. Forbes.....	Supt. Public Works
Joshua D. Tucker.....	Comr. Public Lands
H. W. Kinney.....	Supt. Public Instruction
J. H. Fisher.....	Auditor
W. P. Jarrett.....	High Sheriff
G. R. Clark.....	Secretary to Governor

Jonah K. Kalanianaole.....	Delegate to Congress
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LEGISLATIVE BODY.

SENATORS.

Hawaii—D. K. Baker, R. H. Makekau, D. E. Metzger, S. L. Desha.
Maui—H. A. Baldwin, H. B. Penhallow, W. P. Robinson.
Oahu—A. L. Castle, C. F. Chillingworth, J. L. Coke, C. P. Iaukea, A. J. Wirtz, E. W. Quinn.
Kauai—C. A. Rice, M. A. Mikaele.

REPRESENTATIVES.

Hawaii—H. L. Holstein, J. P. Hale, G. H. Huddy, D. K. Kaupiko, H. L. Kawewehi, N. K. Lyman, M. K. Makekau, E. de Silva.
Maui—W. F. Crockett, A. Garcia, P. J. Goodness, R. J. K. Nawahine, A. F. Tavares, E. Waiaholo.
Oahu—C. H. Brown, C. H. Cooke, D. P. R. Isenberg, W. T. Rawlins, N. Watkins, W. Williamson, E. K. Ai, E. J. Crawford, W. H. Crawford, E. K. Fernandez, H. Vieira, D. M. Kupihea.
Kauai—J. H. Coney, J. Fassoth, J. K. Kula, J. K. Lota.

NATIONAL GUARD OF HAWAII.

Lucius E. Pinkham.....	Governor and Commander in Chief
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GENERAL STAFF OFFICERS.

Saml. I. Johnson, Brig. Genl.....	Adjutant General
Charles W. Ziegler.....	Maj. and Insp. Genl.
Charles B. Cooper.....	Maj. and Surg. Genl.
I. M. Stainback.....	Maj. and Judge Adv.
A. W. Neely.....	Maj., Ordnance Dept.
E. D. Kilbourne.....	Maj. Med. Dept.
Rudolph W. Benz.....	Capt. Med. Dept.
J. D. Dougherty.....	Maj. and Aide to Gov.
H. Van Gieson.....	Capt. Q. M. Corps
Jay M. Kuhns.....	1st Lt. Med. Dept.

Department of Judiciary.

SUPREME COURT.	
Chief Justice	Hon. A. G. M. Robertson
Associate Justice	Hon. E. M. Watson
Associate Justice	Hon. R. P. Quarles

CIRCUIT COURTS.

First Judge 1st Circuit, Oahu.....	Hon. C. W. Ashford
Second Judge 1st Circuit, Oahu.....	Hon. W. L. Whitney
Third Judge 1st Circuit, Oahu.....	Hon. T. B. Stuart
Second Circuit, Maui.....	Hon. W. E. Edings
Third Circuit, Hawaii.....	Hon. J. A. Matthewman
Fourth Circuit, Hawaii.....	Hon. C. F. Parsons
Fifth Circuit, Kauai.....	Hon. Lyle A. Dickey

CLERKS OF COURTS.

Clerk Supreme Court	J. A. Thompson
Asst. Clerk, Supreme Court	Robt. Parker, Jr.
Stenographer, Supreme Court	Miss Kate Kelly
Bailiff and Librarian Supreme Court	J. M. Ulunahele
Copyists	Wm. Hoopai, Edith Mossman

Circuit Court, First Circuit.

Chief Clerk and Cashier	Henry Smith
Assistant Clerk	Jno. A. Dominis
Clerks, 1st Judge	H. Ashford, J. Cullen
Clerks, 2d Judge	A. K. Aona, C. M. Hite
Clerks, 3rd Judge	B. N. Kahalepuna, S. Meheula
Stenographers	J. L. Horner, H. R. Jordan, Ellen Dwight
Clerk Second Circuit, Maui	E. H. Hart
Clerk, Third Circuit, Hawaii	E. M. Miller
Clerk Fourth Circuit, Hawaii	C. H. W. Hitchcock
Clerk Fifth Circuit, Kauai	D. Wm. Dean

COURT INTERPRETERS.

Hawaiian.....	C. L. Hopkins
Japanese.....	Chester Doyle
Chinese.....	Say Kau Lan

DISTRICT MAGISTRATES.

Oahu.	
Jas. M. Monsarrat.....	Honolulu
Alexr. D. Larnach, Second	Honolulu
S. Hookano.....	Ewa
W. D. Holt.....	Waianae
L. B. Nainoa.....	Koolauloa
A. S. Mahauu.....	Waialua
E. Hore, Second.....	Waialua
E. P. Aikue.....	Koolaupoko
Henry Cobb Adams, Second	Koolaupoko

Maui.

W. A. McKay.....	Wailuku
John Brown, Jr.....	Lahaina
S. Kahoolahala.....	Second Lahaina
Guy S. Goodness.....	Makawao
Edward Wilcox.....	Second Makawao
D. K. Wallehua.....	Hana
J. K. Pliamanu.....	Second Hana
C. C. Conradt.....	Molokai
Jos. E. Conradt.....	Kalawao
J. D. McVeigh.....	Second Kalawao

Hawaii.

Wm. S. Wise.....	Hilo
W. H. Smith, Second.....	Hilo
T. E. M. Osorio.....	North Hilo
R. H. Atkins.....	North Kohala
H. C. Davis.....	South Kohala
Henry Hall.....	Hamakua
M. S. Botelho, Second.....	Hamakua
Jos. S. Ferry.....	Puna
S. H. Haaheo, Second.....	Puna
Walter H. Hayselden.....	Kau
Chas. H. White, Second.....	Kau
J. L. Kaulukou.....	North Kona
Robt. Makahalupa.....	South Kona

Kauai.

Chas. S. Dole.....	Lihue
Jas. H. K. Kaiwi, Second.....	Lihue
D. K. Kapahee.....	Koloa
Wm. Schimmelfening, Second.....	Koloa
Wm. Huddy.....	Hanalei
C. B. Hofgaard.....	Waimea
J. K. Kapuniai.....	Waimea
R. Puuki.....	Kawaihau

DEPARTMENT OF SECRETARY.

Secretary.....	W. W. Thayer
Chief Clerk of Dept.....	Eben Cushingham
Chris. Holt, R. S. Lono.....	Clerks

FOREIGN REPRESENTATIVES.

Portugal—Consul General.....	Senhor A. Cunha Pessoa
Italy—Consul (acting).....	E. L. S. Gordon
Austria-Hungary—Consul.....	H. P. F. Schultze
Netherlands.....	H. M. von Holt
Norway—Consul.....	L. M. Vetlesen
Denmark.....	C. J. Hedemann
" (acting).....	Dr. F. F. Hedemann
Germany.....	Geo. Rodiek
Mexico—Consul.....	W. Lanz
Peru.....	Bruce Cartwright, Jr.
Chili—Consul.....	J. W. Waldron
" (acting).....	W. Lanz
Great Britain—Consul.....	E. L. S. Gordon
Belgium—Vice-Consul.....	A. Marques
Sweden—Consul.....	Geo. Rodiek
Spain—Consul.....	Luis Guillen Gil
Spain—Vice-Consul.....	T. F. Sedgwick
France—Consular Agent.....	A. Marques
Japan—Consul-General (actg).....	H. Arita
China—Consul.....	Tsz-Ang Woo Huan
Panama—Consul.....	A. Marques
Russia—Vice-Consul.....	A. Marques
Panama—Consul, Hilo.....	R. T. Guard
Brazil.....	A. D. Castro

DEPARTMENT OF ATTORNEY GENERAL.

Attorney-General.....	I. M. Stainback
1st Deputy Atty.-General.....	A. G. Smith
2nd Deputy Atty.-General.....	W. H. Heen
Clerk of Dept.....	Miss E. A. Robinson
Stenographer.....	Ana K. Harrison
High Sheriff.....	Wm. P. Jarrett

BOARD OF PRISON INSPECTORS.

Oahu—J. W. Waldron, J. M. Dowsett, E. H. Wodehouse.
Maui—Wm. Henning, G. Freeland, J. Garcia.
W. Hawaii—H. H. Renton, M. A. Malakaua.
E. Hawaii—W. Weight, C. E. Wright, Geo. Cool.
Kauai—A. S. Wilcox, J. M. Lydgate, H. Wolters.

TREASURY DEPARTMENT.

Treasurer.....	C. J. McCarthy
Registrar of Public Accts.....	H. C. Hapai
Dep. Reg. and Bookkeeper.....	T. Treadway
Stenographer and Typewriter.....	Edith Jordan
Clerks.....	Saml. Kekumano, S. H. Kahalewai

BUREAU OF CONVEYANCES.

Registrar of Conveyances.....	C. H. Merriam
Deputy Registrar.....	Geo. C. Kopa

ASSESSORS AND COLLECTORS.

First Division, Oahu.

Chas. T. Wilder.....	Assessor
A. W. Neely.....	Deputy 1st Division
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H. G. Hayselden.....	Ewa and Waianae
Edward Hore.....	Waialua
J. Kekuku.....	Koolauloa
H. C. Adams.....	Koolaupoko

Second Division, Maui.

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T. B. Lyons.....	Wailuku
J. M. Ambrose.....	Lahaina
W. Henning.....	Makawao
W. H. Cooper.....	Hana
J. M. Ambrose.....	Molokai and Lanai

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O. T. Shipman.....	Assessor
D. W. Branco.....	North Hilo
G. D. Supe.....	South Hilo
Geo. Mundon.....	Puna
W. H. Lainaholo.....	Kau
A. G. Correa.....	North Kona
A. G. Correa.....	South Kona
S. P. Woods.....	North Kohala
Moses Koki.....	South Kohala
Robt. Gillespie.....	Hamakua

REGISTER AND DIRECTORY.

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Fourth Division, Kauai.

J. K. Farley.....	Assessor
Chas. Blake.....	Koloa
J. K. Kapuniai.....	Waimea
L. D. Timmons.....	Lihue
L. B. Boreiko.....	Hanalei
M. R. Teves.....	Kawaihau

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Assistant.....	M. A. Madsen
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J. Richard.....Dairy and Live Stock Insptr.	
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.....Assistant Engineers	
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C. D. Lufkin, D. C. Lindsay, W. F. Kaae, D. H. Case.	

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Walter A. Engle.....Chief Clerk
Henry Peters.....First Clerk
Eileen Bertelman.....Second Clerk
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Miss Rose Holt.....Fourth Clerk

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2nd District, Hamakua.....Jos. G. Andrews
3rd District, Kona.....Julian K. Yates
3rd District, Kauai.....W. H. Hayesden
4th District, Maui.....W. O. Aiken
5th District, Oahu.....W. A. Engle
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Commissioners.

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Maui.....D. C. Lindsay
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Inspector, Normal.....Geo. S. Raymond

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Oahu—James C. Davis.
Maui—Wm. McCluskey.
Hawaii, East—Bertha B. Taylor; Hawaii,
West—Eugene Horner.
Kauai—H. H. Brodie.
Secretary.....Miss Daisy Smith
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Asst. Clerk.....Miss Eleanor L. Holt
Asst. Clerk.....H. H. Williams

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H. L. Ross.....S. Kona
F. A. St. Sure.....S. Kohala
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L. L. Sexton.....S. Hilo
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A. R. Thomas.....Kau
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CIVIL SERVICE COM. BRD. HEALTH.

W. C. McGonagle, W. Wolters, Dr. F. F. Hedemann.

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Drs. W. L. Moore, G. H. Herbert.

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J. P. Cooke, C. R. Forbes, R. H. Trent.

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Established 1913.

Chairman.....Chas. R. Forbes
MembersJ. N. S. Williams, A. J. Gignoux

TERRITORIAL CONSERVATION COMMISSION.

W. O. Smith, W. F. Dillingham, A. Gartley, J. G. Smith.

CHAMBER OF COMMERCE OF HONOLULU.

Reorganized May 27, 1914.

President.....F. L. Waldron
1st Vice-President.....E. F. Bishop
2nd Vice-President.....J. F. C. Hagens
Treasurer.....H. H. Walker
Secretary.....Raymond C. Brown
Directors—E. A. Berndt, E. F. Blake, J. P. Cooke, G. F. Bush, R. B. Booth, G. P. Denison, E. H. Paris, E. I. Spalding, E. D. Tenney, A. Lewis, Jr., F. J. Lowrey, W. H. McInerny, J. L. McLean, S. S. Paxson, R. W. Shingle, L. A. Thurston, N. Watkins, G. P. Wilder.

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Organized

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Vice-President.....Wm. McKay
Secretary-Treasurer.....E. N. Deyo
Directors—D. E. Metzger, J. A. Scott, D. S. Bowman, Geo. A. Cool, G. H. Viars, C. Castendyk, Rev. G. Laughton, W. H. Heen.

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Vice-President.....R. A. Wadsworth
Secretary.....D. H. Case
Treasurer.....C. D. Lufkin

KAUAI CHAMBER OF COMMERCE.

Organized 1913.

President.....W. C. Avery
Vice-President.....T. Brandt
Secretary.....L. D. Timmons
Treasurer.....J. I. Silva
Auditor.....Carl Bayer

HAWAII PROMOTION COMMITTEE.

Representing the Territory of Hawaii and Chamber of Commerce.
Organized 1903.

E. A. Berndt, Chairman; Ed. Towse, L. A. Thurston, A. F. Wall, Benj. Hollinger, G. H. Angus, W. O. Aiken, D. P. R. Isenberg, G. H. Vicars.
A. P. Taylor.....Secretary and Director
B. von Damm.....Treasurer

HONOLULU STOCK AND BOND EXCHANGE.

Organized August 8, 1898.

President.....E. C. Duisenberg
Vice-President.....H. C. Carter
Secretary.....H. B. Giffard
Treasurer.....Bishop Trust Co.

HAWAIIAN SUGAR PLANTERS' ASSOCIATION.

Re-organized Nov. 18, 1895.

President.....A. W. T. Bottomley
Vice-President.....Geo. Rodiek
Secretary and Treasurer.....W. O. Smith
Assistant Sec.-Treas.....L. J. Warren
Auditor.....J. W. Waldron

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R. C. L. Perkins, A. Koebele.....Consulting Entomologists
Otto H. Swezey.....Entomologist
F. Muir, H. T. Osborn.....Assistant Entomologists
H. L. Lyon.....Pathologist
Alden T. Speare.....Asst. Pathologist
R. S. Norris.....Sugar Technologist
P. S. Burgess.....Chemist

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 J. P. Melanphy.....Fertilizer Sampler
 W. P. Naquin.....Agriculturist
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 la, A. Fries, H. Johnson.

HAWAIIAN ENTOMOLOGICAL SOCIETY.

Organized 1905.

President.....E. M. Ehrhorn
 Vice-President.....J. F. Illingworth
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 The above officers also constitute the
 Executive Committee.
 Editor of Proceedings.....O. H. Swezey

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 Secretary.....Geo. W. Smith
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 Physicians—Drs. J. T. McDonald, F.
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 Resident Physician.....Dr. Plum
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 Specialist.....Dr. W. G. Rogers
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Treasurer.....	A. W. T. Bottomley
Auditor.....	W. F. Dillingham
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Opened Nov. 24, 1909.

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Secretary	Irene Dyches
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Superintendent.....	Miss J. N. Dewar
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Organized 1853.

Meets annually in December.

President.....	F. A. Schaefer
Secretary	C. H. Atherton
Treasurer	Jno. Waterhouse
Trustees—	J. A. Kennedy, Geo. Ro- diek, R. Ivers.

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Organized Jan. 26, 1905.

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Vice-President.....	A. F. Cooke
Secretary.....	G. W. Paty
Treasurer.....	J. M. McChesney

TERRITORIAL LIBRARY.

HONOLULU LIBRARY ASSOCIATION.

Organized March.

Incorporated June 24, 1879.

President.....	Prof. M. M. Scott
Secretary.....	J. H. Fisher
Treasurer	A. Gartley
Auditor.....	J. H. Fisher

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President.....	Wm. Hyde Rice
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Organized Jan. 11, 1892.

President.....F. M. Hatch
Vice-Presidents—C. H. Hitchcock, H.
M. Ballou.
Recording Secretary.....Edgar Wood
Cor. Secretary.....W. D. Westervelt
Treasurer.....Bruce Cartwright, Jr.
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Carlotta M. Roscoe....Loan Desk Asst.
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Carrie P. Green.....Reference Librarian
Mary S. Lawrence..Children's Librarian
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Organized June 28, 1899.

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Vice-President.....W. F. Frear
Secretary.....E. W. Sutton
Treasurer.....C. H. Olson

HAWAIIAN PHILATELIC SOCIETY.
Organized April 13, 1911.

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Vice-President.....A. L. Mackaye
Secretary.....A. C. O. Linneman
Treasurer.....E. M. Ehrhorn
Trustees—E. M. Ehrhorn, C. J. Cooper,
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Y. M. C. A. CHESS CLUB.
Organized Oct. 17, 1913.

President.....F. S. Hafford
Vice-President.....A. L. Mackaye
Sec.-Treasurer.....A. E. Larimer

HAWAIIAN MEDICAL ASSOCIATION
Organized May 24, 1895.

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Vice-President.....Dr. F. E. Trotter
Secretary.....Dr. A. F. Jackson
Treasurer.....Dr. I. J. Shepherd
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G. Hodgins.

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Organized June 17, 1895.

President.....Dr. S. D. Barnes
Vice-President.....G. P. Wilder
Secretary.....J. T. Taylor
Treasurer.....W. J. Forbes
Registrar.....H. P. Judd
Board of Managers—E. D. Baldwin,
W. A. Bryan, R. L. Halsey.

ALOHA CHAPTER, DAUGHTERS OF THE AMERICAN REVOLUTION.

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Vice-Regent.....Mrs. J. M. Atherton
Recording Sec....Miss Carolyn Church
Treasurer.....Miss Charlotte V. Hall
Registrar.....Mrs. C. B. Andrews
Historian.....Miss M. S. Lawrence
Chaplain.....Mrs. A. F. B. Judd

HAWAIIAN EVANGELICAL ASSOCIATION.

Originally Organized 1823.
Constitution revised 1863. Annual Meeting June.

President.....F. J. Lowrey
Vice-President.....A. C. Alexander
Cor. Secty. (act'g)....Rev. H. P. Judd
Rec. Secretary....Rev. J. L. Hopwood
Treasurer.....Theo. Richards
Auditor.....Wm. J. Forbes

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Organized 1871.

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Mrs. W. S. Bowen, Mrs. J. D. Marques.
Recording Secretary.Miss M. L. Sheeley
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Foreign Cor. Secty.....Miss A. E. Judd
Treasurer.....Mrs. B. F. Dillingham
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Organized 1851. Annual Meeting June.

President.....Miss Agnes Judd
Vice-President.....Geo. R. Carter
Secretary.....Mrs. R. W. Andrews
Recorder.....R. W. Andrews
Treasurer.....L. A. Dickey

**YOUNG MEN'S CHRISTIAN
ASSOCIATION.**

Organized 1869. Annual Meeting April.
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 Rec. Secretary.....Robt. Anderson
 Treasurer.....R. A. Cooke
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 Men's Secretary.....A. E. Larimer
 Intermediate Secretary.....Wm. H. Dreier
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 Boys' Work Secretary.....Chas. F. Loomis
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ASSOCIATION.**

Organized 1900.

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 President.....Mrs. W. F. Frear
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 Mrs. H. McK. Harrison.
 Secretary.....Mrs. F. C. Atherton
 Cor. Secretary.....Mrs. Chas. T. Fitts
 Treasurer.....Mrs. Spencer Bowen
 General Secretary.....Miss C. B. Chandler

**WOMAN'S CHRISTIAN TEMPERANCE
UNION OF HAWAII.**

Organized December, 1884.

President.....Mrs. J. M. Whitney
 Vice-Presidents — Mrs. Ida Weedon,
 Mrs. A. A. Ebersole.
 Recording Secty....Miss Florence Yarrow
 Cor. Secretary.....Mrs. E. W. Jordan

**FREE KINDERGARTEN AND CHIL-
DREN'S AID ASSOCIATION.**

Organized 1895.

President.....Mrs. Richard Ivers
 Vice-Presidents — Mrs. L. T. Peck,
 Mrs. A. Lewis, Jr., Mrs. S. B.
 Dole.
 Recording Secretary....Miss Nora Sturgeon
 Treasurer.....Mrs. F. M. Swanzy
 Auditor.....D. W. Anderson

ASSOCIATED CHARITIES.

Organized June 7, 1899.

President.....J. R. Galt
 1st Vice-President.....Hon. S. B. Dole
 2nd Vice-President.....
 Mrs. F. W. Macfarlane
 Treasurer.....R. J. Buchly
 Secty. and Manager.....Edgar Brooks

STRANGERS' FRIEND SOCIETY.

Organized 1852. Annual Meeting June.

President.....Mrs. A. Fuller
 Vice-Presidents—Mrs. E. F. Bishop,
 Mrs. S. B. Dole.
 Secretary.....Mrs. S. M. Damon
 Treasurer.....Mrs. E. W. Jordan
 Auditor.....E. W. Jordan
 Directress.....Mrs. E. B. Waterhouse

BRITISH ASSOCIATION OF HAWAII.
 Organized 1869.

President (ex-officio)....H.B.M.'s Consul
 Vice-President.....Rev. Wm. Ault
 Secretary.....A. L. C. Atkinson
 Treasurer.....W. H. Baird
 Directors—F. Harrison, R. Anderson,
 J. C. McGill, W. F. Wilson, W.
 Simpson, J. N. S. Williams.

GERMAN BENEVOLENT SOCIETY.
 Organized August 22, 1856.

President.....F. A. Schaefer
 Vice-President.....Geo. Rodiek
 Secretary.....John F. Eckardt
 Treasurer.....H. A. Schroeder
 AuditorH. Hugo

HAWAIIAN RELIEF SOCIETY.
 Organized 1895.

President.....Mrs. C. S. Holloway
 Secretary.....Mrs. E. S. Cunha
 Treasurer.....Mrs. F. W. Macfarlane

**PORTUGUESE CHARITABLE
SOCIETY.**

Organized 1902. Reorganized 1915.

President.....J. A. R. Vieira
 Vice-PresidentJ. Ross
 Secretary.....F. R. Tranquada
 Treasurer.....J. D. Marques

HAWAIIAN HUMANE SOCIETY.

President.....Mrs. L. L. McCandless
 Hon. President.....Mrs. S. B. Dole
 Vice-Presidents—Mrs. S. M. Damon,
 Mrs. R. D. Mead, Mrs. B. Wal-
 bridge, Mrs. E. P. Low, Mrs. W.
 R. Castle, Mrs. C. S. Holloway.
 Secretary.....Mrs. M. F. Prosser
 Treasurer.....Mrs. J. S. Emerson
 Auditor.....H. M. Dowsett
 Humane Officer.....Miss Lucy Ward

OAHU CEMETERY ASSOCIATION.

President.....F. J. Lowrey
 Vice-President.....S. G. Wilder
 Secretary.....H. H. Walker
 Treasurer.....Hawaiian Trust Co.

ANTI-SALOON LEAGUE OF HAWAII.
 Organized March 4, 1901.

Superintendent.....John W. Wadman
 President.....D. C. Peters
 Vice-President.....W. D. Westervelt
 Vice-Pres. Honorary....Mrs. J. M. Whitney
 Secretary.....Geo. W. Paty
 Treasurer.....C. H. Dickey

THE OUTDOOR CIRCLE.
 (For the beautifying of Honolulu.)

President.....Mrs. F. J. Lowrey
 Vice-President.....Mrs. L. A. Thurston
 Sec.-Treas.....Mrs. W. L. Moore
 Ex. Officer.....Mrs. A. E. Murphy

PACIFIC CLUB.

Organized 1852. Premises on Alakea Street, two doors below Beretania.

President.....Dr. C. B. Cooper
Vice-President.....J. F. C. Hagen
Secretary.....A. L. C. Atkinson
Treasurer.....A. J. Campbell
Governors—W. H. Baird, R. Ivers, J. O. Carter, E. I. Spalding, Dr. St. D. G. Walters, with the above officers, comprise the Board.

UNIVERSITY CLUB.

Organized 1905.

President.....E. A. Mott-Smith
Vice-President.....Dr. H. V. Murray
Secretary.....E. W. Sutton
Treasurer.....A. M. Nowell
Auditor.....M. M. Graham
Governors—Admiral C. B. T. Moore, Col. W. C. Rafferty, A. F. Afong.

COMMERCIAL CLUB OF HONOLULU.

Organized Aug. 30, 1906.

President.....A. Waterhouse
Vice-President.....L. M. Judd
Secretary.....S. M. Lowrey
Treasurer.....J. K. Clarke

BRITISH ASSOCIATION CLUB.

Club Rooms Campbell Block.

President.....Fred. Harrison
Secretary.....J. C. Veitch
Treasurer.....A. T. Henderson

BUCKEYE CLUB.

Organized 1904.

President.....Guy H. Buttolph
Vice-President.....Miss H. Hitchcock
Secretary.....Mrs. Ida Weedon
Treasurer.....Dr. H. Bicknell

COUNTRY CLUB.

Organized 1906.

President.....E. W. Sutton
1st Vice-President.....E. I. Spalding
2nd Vice-President.....A. C. Wall
Secretary.....G. H. Buttolph
Treasurer.....J. O. Young

HAWAIIAN ENGINEERING ASSOCIATION.

Organized

Chairman.....A. C. Wheeler
Vice-Chairman.....C. B. Andrews
SecretaryIrwin Spalding
Treasurer.....G. A. McEldowney

OUTRIGGER CLUB.

Organized May, 1908.

President.....Guy H. Tuttle
Vice-President.....G. H. Buttolph
Secretary.....J. A. Beavens
Treasurer.....H. B. Campbell
Captain.....H. E. Podmore

HUI NALU (Surf Club).

Organized 1911.

President.....Wm. T. Rawlins
Vice-President.....Al. Castle
SecretaryHarry Bertelmann
TreasurerAlex. May
Commodore.....E. K. Miller
CaptainDuke Kahanaomoku
Auditor.....J. K. Evans

HAWAII YACHT CLUB.

Commodore.....F. M. Hatch
Vice-Commodore.....F. B. Smith
Secretary and Treasurer.....C. T. Wilder
Measurer.....O. L. Sorenson
Captain.....C. T. Wilder

MYRTLE BOAT CLUB.

Organized Feb. 5, 1883.

President.....J. H. Schnack
Vice-PresidentIrwin Spalding
Secretary.....A. J. Porter
CaptainGeo. Crozier

HEALANI YACHT AND BOAT CLUB.

Incorporated Dec., 1894.

PresidentFred. Wichman
Vice-PresidentH. Lempke
Secretary.....A. C. Reinecke
TreasurerH. Decker
CaptainChas. Brown
Vice-CaptainChas. Franz
CommodoreFrank Dillon

AD CLUB.

President.....W. R. Farrington
1st Vice-President.....J. D. Levenson
2nd Vice-President.....J. T. Warren
Secretary.....H. L. Strange
Treasurer.....C. R. Frazier

OAHU COLLEGE.

Punahou Academy.

Arthur F. Griffiths, A. M.—President.
Susan G. Clark—Latin and Greek (On leave).
Levi C. Howland—Head of Commercial Dept.; Asst. Business Agent.
Wilbur J. MacNeil—Science.
Antoinette J. Foster, Olmer P. Gump—English.
Charlotte P. Dodge—History (On leave).
Eda A. Schmutzler, Elsa G. Downer—French.
Charles F. Schmutzler—German, Latin.
Ernest T. Chase—Vice-Principal, Mathematics.
Clara M. Brawthen—Commercial; Edith M. Guild, Asst.
Ethel M. Damon—French, History (On leave).
Agnes P. Driver—Physical Instruction of Girls.
Frank E. Midkiff—Mathematics, English, Science.
Lester G. French—School Singing.
Kathleen McNutt—Drawing.

Sarah W. Dow—Latin.	Frank T. Dillingham, B. S.....
Stanley Livingston—Mathematics; Director Boarding Department.	..... Prof. of Chemistry (On leave absence 1915-16.)
Sarah E. Mathews—History.	Arthur L. Andrews, B.L., M.L., Ph.D..... Professor of English
Carl E. Sager—Mathematics, Science, Drawing.	Vaughan MacCaughey, B.S.A..... Professor of Botany
Maud Hastings—Oral Expression.	James F. Illingworth, B.S., Ph.D..... Professor of Entomology
Maud Seyde—Accompanist.	Herbert S. Walker, A.B..... Professor of Sugar Technology
Maud Taylor—Matron.	Jared G. Smith, B.S. Prof. of Agronomy
Mabel M. Hawthorne—Librarian; Avis G. Yates, Asst.	Joseph F. C. Rock..... Botanist
Jonathan Shaw—Business Agent.	Minnie E. Chipman
Frank Barwick—Supt. of Grounds.	..... Professor of Ceramics and Design
H. G. Wootten—Engineer.	Arnold Romberg, B.S., Ph.D..... Professor of Physics
Hazel Buckland, Aileen L. Gibb—Secretaries.	Florence M. Lee, B. S..... Asst. Prof. of Domestic Science
E. D. Kilbourne, M.D.—Medical Examr.	Leslie C. Clark, B.S..... Asst. Prof. of Animal Husbandry
Punahou Music School.	Mildred M. Yoder, Ph.B..... Instructor in History and Economics
Margaret E. Clarke, Director—Piano and Organ.	John McTaggart
Helen G. Cadwell—Piano and Voice.	Instructor in Shop Work
Pearl Sutherland—Piano.	Maria Heuer
Edwin Herbert Ideler—Violin.	..... Asst. Prof. of Modern Languages
Edith C. Gatfield—Piano.	Alice A. Ball, Ph.C., B.S., M.S..... Instructor in Chemistry
Cara Genevieve Young—Assistant.	George H. W. Barnhart, B.S..... Instructor in Engineering
Punahou Preparatory School.	Carl B. Andrews, B.S., M.S..... Instructor in Railroad Surveying
Charles T. Fitts—Principal.	Alice E. Harbaugh..... Asst. in Drawing and Ceramics
Mary P. Winne—Associate Principal, Second Grade.	Henry Z. Pratt, Jr., C.E..... Instructor in Engineering
Claire H. Uecke—First Grade.	Elizabeth L. Bryant, Sc.D..... Librarian
Emma Barnhard — First and Second Grades.	
Sara S. Mulnix, Mabel J. Long — Third Grade.	
Florence N. Carter, Juanita H. Day — Fourth Grade.	
Anna F. Johnson, Fredrica Davis—Sixth Grade.	
Blanche M. Folsom, Hope Y. Little — Fifth Grade.	
Zella Breckenridge—Eighth Grade.	
Agnes P. Driver—Physical Instruction.	
Evangeline Holmes—Eighth Grade and Mathematics.	
Harriet B. Crompton, Helen E. Hasty—Seventh Grade.	
Elsa G. Downer—German.	
Lester G. French—School Singing.	
Mabel J. Long—Second Grade.	
Sara S. Mulnix—Third Grade and Sewing.	
Kathleen McNutt—Hand-Work and Art.	
BOARD OF REGENTS, COLLEGE OF HAWAII.	
Wallace R. Farrington..... Chairman	
Arthur L. Dean..... Secretary	
Regents—Alonzo Gartley, C. R. Hemenway, Mrs. J. R. Ashford, F. L. Waldron.	
The Faculty.	
Arthur L. Dean, A.B., Ph.D.....	Robert Day Williams, Ph.D... Principal
..... Pres. and Prof. of Chemistry	John F. Nelson..... Vice-Principal
John S. Donaghho, A.B., A. M.....	Teachers—Miss Mary E. Stambaugh.
..... Prof. of Math. and Astronomy	Miss Elizabeth J. Jones, Miss Julia R. Peabody, Miss Edna M. Byrd, Mr. H. L. Botts, Mr. Merle L. Copeland.
John M. Young, B.S., M.E.....	Mr. Jerome L. Mears, Mr. William E. Ferney, Mr. H. Milnor Blowers, Mr. George E. Merritt, Mr. C. C. Cassingham.
Prof. of Engineering, College Engr.	
William A. Bryan, B.S.. Prof. of Zoology	
Arthur E. Keller, C. E., LL.B.....	
..... Prof. of Civil Engineering	
(On leave absence 1915-16.)	Harold H. Yost. Supt. Farm and Grounds

KAWAIAHAO GIRLS' SEMINARY.

Mabel E. Bosher—Principal.
Mary F. Kinney, Helen F. Haynes — Sixth, Seventh and Eighth Grades.
Edith Yeomans — Fourth and Fifth Grades.
Roselle F. Faast—First, Second and Third Grades.
Edith V. Currie—Domestic Art; Ling tai Soon, Assistant.
Ethel F. Mills—Vocal and Instrumental Music.
Mrs. Hinckley—Nursing, Physiology, Hygiene.
Mary Campbell—Domestic Science, Matron; Esther Kalino, Assistant.
Tsuru Kishimoto, Japanese, and Wai Hong Loo, Chinese Classes.
Syu Yun Ching—Office Assistant.
Dr. A. F. Jackson—School Physician.

MILLS INSTITUTE.

Robert Day Williams, Ph.D... Principal
John F. Nelson..... Vice-Principal
Teachers—Miss Mary E. Stambaugh.
Miss Elizabeth J. Jones, Miss Julia R. Peabody, Miss Edna M. Byrd, Mr. H. L. Botts, Mr. Merle L. Copeland.
Mr. Jerome L. Mears, Mr. William E. Ferney, Mr. H. Milnor Blowers, Mr. George E. Merritt, Mr. C. C. Cassingham.

Mrs. Philip Frear..... Matron
 Mr. Yassaburo Sakai..... Japanese
 Mr. Tong Quan Yan..... Chinese
 Arthur Hudson..... Music Director
 Dr. A. F. Jackson..... School Physician

THE KAMEHAMEHA SCHOOLS.

E. C. Webster..... President
 J. L. Hopwood..... Chaplain
 A. B. Sill..... Business Agent
 C. D. Bishop..... Accountant
 Dr. E. D. Kilbourne..... Physician

Boys' School.

C. R. Bostwick..... Principal
 U. Thompson..... Science
 C. G. Livingston..... Drawing
 E. G. Bartlett..... Mathematics
 G. A. Andrus..... Mathematics and Music
 M. E. Cresman..... Wood-working
 J. J. Mengel. Blacksmithing and Forging
 E. E. Baty..... Electrician
 J. T. Boyd..... Machinist
 N. G. Smith..... Painter
 R. J. Borden-J. D. French..... Agriculturalists

Geo. Benjamin..... Asst. Wood-working
 Miss Minnie Armstrong..... English
 Miss Emma Winslow..... English and Geography
 Miss Dalla Sturm..... Nurse

Mrs. A. M. Bradstreet..... Matron
 Lieut. A. J. Booth..... Commandant

Boys' School Preparatory Department.

Miss Alice Knapp..... Principal
 Maud Post..... Primary
 Nevada Moore..... Manual Training
 Myrtle Campbell..... 3d and 4th Grades
 Annabelle Mitchell..... 1st and 2d Grades
 Winifred Farwell..... Matron

Gladys Whittenburger..... Office and Library Assistant
 Julia Coleman..... Office and Dormitory Assistant

Lucilla Kamakawiwoole, Emily Kekaula, Mrs. Anna Sahr, Mr. A. G. Hottendorf Assistants

Girls' School.

Miss Abbie H. Newton..... Principal
 Frances Lemmon..... Mathematics and Civics

Harriet McCracken..... Matron
 Carolyn Church..... Domestic Art and Sewing

Anna Reid..... Language and English Literature
 Katharine Burgner..... Geography and Nature Study

Ida Glenn..... Drawing
 Lydia Aholo...Stenog. and Typewriting

Gertrude Knowles..... Music
 Ora Saunders....Nurse, and Physiology

Dorothea Knox..... Dressmaking
 Sue Markley..... History and Reading

Irene Sylva, Emma Napoleon, Florence Abbey, Eliza Nainoa..... Office Assistants

E. H. Mandeville...Matron, Senior Hall

HONOLULU (STEAM) FIRE DEPARTMENT.

Originally organized 1851, and conducted as volunteers till March 1, 1893, when it was changed to a paid dept.

Chief Engineer—Chas. Thurston.
 Asst. Engineer—Wm. Blaisdell.
 Engine No. 1—Location Central Station, cor. Fort and Beretania streets.
 Engine No. 2—Location, Central Station, cor. Fort and Beretania Sts.
 Chemical Co. No. 1—Location, Central Station, cor. Fort and Beretania Sts.
 Hook and Ladder Truck—Location, Central Station, cor. Fort and Beretania.
 Engine Co. No. 3—Location cor. Wilder avenue and Piikoi street.
 Engine Co. No. 4—Location King street and Austin lane.
 Engine Co. No. 5—Location Kaimuki.

PRINCIPAL PUBLICATIONS.

The Hawaiian Gazette, issued semi-weekly by the Hawaiian Gazette Co., Ltd., on Tuesdays and Fridays. R. O. Matheson, Editor.

Sunday Advertiser, issued every Sunday morning by the Hawaiian Gazette Co., Ltd. R. O. Matheson, Editor.

The Daily Pacific Commercial Advertiser, issued by the Hawaiian Gazette Co. every morning (except Sunday). R. O. Matheson, Editor.

The Honolulu Star-Bulletin, issued every evening (except Sundays), by the Honolulu Star-Bulletin, Ltd. Riley H. Allen, Editor. Semi-weekly issued on Mondays and Thursdays.

The Guide, issued every Tuesday and Friday morning by the Guide Pub. Co.

The Friend, Organ of the Hawaiian Board, issued on the first of each month. Rev. Doremus Scudder, Editor.

The Hawaiian Church Chronicle, issued on the first Saturday of every month. Rt. Rev. H. B. Restarick, Editor.

The Paradise of the Pacific, issued monthly. Mrs. E. A. Langton-Boyle, Publisher.

The Mid-Pacific Monthly, an illustrated descriptive magazine. Alex. Hume Ford, Editor and Publisher.

The Hawaiian Forester and Agriculturist, issued monthly under direction of Board of Com. Agr. and Forestry. Daniel Logan, Editor.

The Kuokoa (native), weekly, issued every Friday morning by the Hawaiian Gazette Co., Ltd. Solomon Hanohano, Editor.

Aloha Aina (native), issued every Saturday. J. T. Ryan, Editor.

Ka Holomua (native), issued each Saturday.

O Luso (Portuguese), issued weekly on Saturdays. M. G. Santos, Editor.

Chee Yow Shin Bo (The Liberty News), tri-weekly, Chinese.

Sun Chung Kwock Bo, tri-weekly. Chinese.

Hawaii Shinpo, issued daily in Japanese.

S. Sheba, Proprietor.

Hilo Tribune, issued weekly on Saturdays by The Tribune Pub. Co., Hilo. J. H. McSwanson, Editor.

The Hawaii Herald, issued weekly at Hilo on Thursdays by the Herald Pub. Co. V. L. Stevenson, Editor.

The Kohala Midget, issued each Thursday, at Kohala. Dr. J. F. Cowan, Editor.

The Maui News, issued weekly at Wailuku, Maui. Will L. Cooper, Editor and Manager.

The Garden Island, issued weekly at Lihue, Kauai. L. D. Timmons, Editor.

Hoku o Hawaii, issued on Friday of each week, at Hilo. Rev. S. L. Desha, Editor.

THE HAWAIIAN ANNUAL, issued the latter part of December for the following year. Thos. G. Thrum, Editor and Publisher.

HONOLULU LODGES, ETC.

Oceanic Lodge No. 371, F. & A. M.; meets on the last Monday in each month in Masonic Hall.

Hawaiian Lodge, No. 21, F. & A. M.; meets in its Hall, Masonic Temple, corner Hotel and Alakea streets, on the first Monday in each month.

Honolulu Chapter, No. 1, R. A. M.; meets in Masonic Hall on the third Thursday of each month.

Honolulu Commandery, No. 1, Knights Templar; meets in Masonic Hall on second Thursday of each month.

Mystic Shrine, Aloha Temple. No stated time of meeting. Meets at Masonic Hall.

Kamehameha Lodge of Perfection, No. 1, A. & A. S. R.; meets in Masonic Hall on the fourth Thursday of each month.

Nuuuanu Chapter of Rose Croix, No. 1, A. & A. S. R.; meets in Masonic Hall on the first Thursday in the month.

Alexander Liholihi Council, No. 1, of Kadosh; meets on the third Monday of alternate months from February.

Honolulu Lodge, No. 409, F. & A. M.; meets at Masonic Hall every second Monday of the month.

Leahi Chapter, No. 2, Order of the Eastern Star; meets on third Monday of each month in Masonic Hall.

Lei Aloha Chapter, No. 3, Order of the Eastern Star; meets on second Saturday of each month in Masonic Temple.

Harmony Chapter, No. 4, Order of the Eastern Star, meets on third Saturday of each month in Masonic Temple, at 7:30 p. m.

Excelsior Lodge, No. 1, I. O. O. F.; meets at the hall in Odd Fellows' Building, on Fort St., every Tuesday evening.

Harmony Lodge, No. 2, I. O. O. F.; meets each Monday evening in Odd Fellows' Building, Fort street.

Pacific Degree Lodge, No. 1, Daughters of Rebekah; meets in Odd Fellows' Building, Fort street, second and fourth Thursdays of each month.

Olive Branch Rebekah, No. 2, I. O. O. F.; meets first and third Thursdays each month in Odd Fellows' Building.

Polynesian Encampment, No. 1, I. O. O. F.; meets in Odd Fellows' Building, Fort street, first and third Fridays of each month.

Canton Oahu, No. 1, P. M., I. O. O. F.; meets second Friday each month in Odd Fellows' Hall, Fort St.

Mystic Lodge, No. 2, K. of P.; meets every Friday evening at Pythian Hall, cor. Beretania and Fort streets.

Section N. 225—Endowment Rank, K. of P.; meets on the second Saturday of January, July and December in Pythian Hall.

Honolulu Temple, No. 1, Rathbone Sisters; meets in Pythian Hall, first and third Tuesday evenings of each month.

Wm. McKinley Lodge, No. 8, K. of P.; meets first and third Tuesday evenings in Pythian Hall.

Hawaiian Tribe, No. 1, I. O. Red Men; meets on first and third Thursdays of each month at Odd Fellows' Hall.

Court Lunalilo No. 6600, A. O. of Foresters; meets at K. of P. Hall on first and third Wednesdays of each month.

Court Camoës No. 8110, A. O. F.; meets second and fourth Tuesday evenings of month in San Antonio Hall.

Geo. W. De Long Post, No. 45, G. A. R.; meets the first Monday of each month in U. S. W. V. Hall.

Theo. Roosevelt Camp, No. 1, Dept. of Hawaii, U. S. W. V.; first and third Saturdays, in their hall.

Geo. C. Wiltse Camp, Sons of Veterans; meets on third Tuesday of each month in San Antonio Hall.

Capt. Cook Lodge, No. 353, Order Sons of St. George; meets at Pythian Hall every Thursday evening.

Court Hawaii, No. 3769, Independent Order of Foresters, meets third Monday of each month.

Damien Council, Young Men's Institute; meets second and fourth Wednesdays of each month at Catholic Mission Hall.

Honolulu Lodge, B. P. O. Elks, 616; meets every Friday evening in the Elks' Building, King street near Fort.

Honolulu Aerie, No. 140, Fraternal Order of Eagles, meets second and fourth Wednesdays each month in K. of P. Hall.

Honolulu Lodge No. 1, Modern Order of Phoenix; meets every Thursday evening at their home, cor. Fort and Beretania.

Honolulu Lodge, L. O. O. M., No. 800; meets second and fourth Thursdays of the month in Pythian Hall.

American Association of Masters and Pilots of Steam Vessels, Honolulu Harbor, No. 54; meets first Sunday of each month at 7 p. m. in Odd Fellows' Hall.

Marine Engineers' Beneficial Association No. 100; meets every second and fourth Monday nights at K. of P. Hall.

Kamehameha Lodge (native); meets last Thursday of each month in Odd Fellows' Hall.

Kauikeaouli Lodge, No. 1 (native); meets on first and third Fridays each month in San Antonio Hall.

PLACES OF WORSHIP.

Central Union Church, Congregational, cor. Beretania and Richards streets; Rev. Doremus Scudder, D. D., pastor; Rev. A. A. Ebersole, assistant pastor. Services every Sunday at 11 a. m. and 7:30 p. m. Sunday school meets one hour before morning service. Prayer meeting Wednesday evenings at 7:30.

Kalihi Union Church, King street, Kalihi; Sunday school at 9:45 a. m. Gospel services at 11:15 a. m. and 7:30 p. m.

Methodist Episcopal Church, corner Beretania and Victoria streets; Rev. L. L. Loofbourouw, pastor. Sunday services 11 a. m. and 7:30 p. m. Sunday school meets at 10 a. m. Prayer meeting Wednesdays at 7:30 p. m.

The Christian Church, Kewalo street. David Carey Peters, pastor. Sunday services at 11 a. m. and 7:30 p. m. Sunday school meets at 9:45 a. m. Prayer meeting Wednesday evenings, at 7:30.

Salvation Army, services held nightly at hall, Hotel street near Nuuanu, with Sunday services at the usual hour.

Roman Catholic Church, Fort street, near Beretania; Rt. Rev. Libert Boeynaems, Bishop of Zeugma. Services every Sunday at 10 a. m. and 4:30 p. m. Low mass every day at 6 and 7 a. m. High mass Sundays and Saints' days at 10 a. m.

St. Andrew's Cathedral, Protestant Episcopal; entrance from Emma street, near Beretania. Rt. Rev. Henry Bond Restarick, Bishop of the Missionary District of Honolulu; Rev. Wm. Ault, Vicar. Holy Communion, 7; Sunday school, 10; morning prayer, litany and sermon, 11; Hawaiian service, 3:30; evening prayer and sermon, 7:30.

Chinese Congregation. Rev. Kong Yim Tet, Curate. Services on Sunday at 11 a. m. and 7:30 p. m. Evening prayer every Wednesday at 7 p. m.

St. Clement's Chapel, Punahoa. Services on Sundays. Holy Communion, 7 a. m. Morning prayer, 11 a. m.; evening prayer, 7:30 p. m. Rev. John Usborne, rector.

Epiphany Mission, Kaimuki, Rev. L. H. Tracy, priest in charge. Sunday services at 7:30 and 11 a. m. Sunday school at 10.

First Church of Christ, Scientist, Fraternity Hall, Odd Fellows' building. Sunday services 11 a. m. Sunday school at 9:45.

Christian Chinese Church, Fort street; Rev. Tse Kei Yuen, acting pastor. Services every Sunday at 10:30 a. m. and 7:30 p. m. Prayer meeting Wednesdays at 7:30 p. m.

German Lutheran Church, Beretania St.; Rev. G. Schafhirt, pastor. Services on Sunday at 11 a. m.; Sunday school at 10 a. m.

Portuguese (Protestant) Mission; Rev. A. V. Soares, pastor. Services every Sabbath at the usual hour. Sunday school at 3 p. m. Chapel situated corner of Punchbowl and Miller streets.

Reorganized Church of Jesus Christ, G. J. Waller, pastor. Services in new chapel on King street near Thomas Square; Sunday school at 10 a. m.; preaching in Hawaiian at 11 a. m.; in English at 7:30 p. m.

Seventh Day Adventists; Rev. F. H. Conway, pastor. Chapel, 767 Kinau street. Sabbath school Saturdays at 10 a. m.; preaching at 11. Wednesday prayer and missionary meeting at 7:30 p. m.

Japanese Union Church (connected with Hawaiian Board Missions); Rev. T. Hori, pastor. Hold services at 10 a. m. Preaching at 11 a. m. and 7:30 p. m. Sunday services. Prayer and praise meeting Wednesdays at 7 p. m.

Japanese Methodist Church. Rev. C. Nakamura, pastor. Hold services in chapel on River street, near St. Louis College.

Japanese Church, cor. Kinau and Pensacola Sts., Rev. T. Okumura, pastor; hold regular services at the usual hours.

Bishop Memorial Chapel, Kamehameha Schools, Rev. J. L. Hopwood, Chaplain. Morning services at 11.

NATIVE CHURCHES.

Kawaiahao Church, cor. King and Punchbowl streets; Rev. H. H. Parker, pastor. Services in Hawaiian every Sunday at 11 a. m. and 7:30 p. m. Sunday school at 10 a. m. Prayer meeting Wednesdays at 7:30 p. m.

Kaumakapili Church, King street, Palama. Rev. H. K. Poepoe, pastor. Sunday services at the usual hours.

Several Clubs and Societies have been discontinued from the ANNUAL'S Register and Directory owing to their non-report of official changes, and difficulty of securing same. In this gratuitous work for convenience of public reference and historic interest in after years, interested parties might at least show appreciation by reporting their boards of officers by the 15th of November each year. Unless a more co-operative spirit in this regard is shown this feature of the ANNUAL will be much reduced in the future.

COUNTY OFFICIALS.

1916.

CITY AND COUNTY OF HONOLULU.	
Mayor.....	John C. Lane
Sheriff.....	Chas. S. Rose
Clerk.....	D. Kalauokalani, Jr.
Auditor.....	Jas. Bicknell
Treasurer.....	D. L. Conkling
City and County Attorney..	A. M. Brown
Supervisors—Wm. Ahia, Chas. N. Arnold, Ben Hollinger, Robt. Horner, Wm. Larsen, Daniel Logan, R. W. Shingle.	
County Engineer.....	L. M. Whitehouse
Chief Engineer Fire Dept.—Chas. H. Thurston.	
Asst. Engineer Fire Dept. — Wm. Blaisdell.	
Supt. Electric Light Dept. and Police and Fire Alarm System—W. L. Frazee.	
1st Deputy County Attorney—A. M. Cristy.	
2nd Deputy County Attorney—Wm. T. Carden.	
Prosecuting Attorney, Police Court —C. F. Chillingworth.	
Bandmaster Hawaiian Band—C. Kailani Peters.	
Supt. Public Parks—A. K. Vierra.	
Supt. Kapiolani Park—John H. Wise.	
COUNTY OF MAUI.	
Sheriff	Clement Crowell
Attorney.....	E. R. Bevans
Auditor	Charles Wilcox
Treasurer.....	L. M. Baldwin
Engineer	W. F. Kaae
Clerk.....	
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